Brush Creek Project

Environmental Assessment

United States
Department of
Agriculture

Forest
Service

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Marienville Ranger District, Allegheny National Forest

Millstone Township, Elk County, and
Barnett and Jenks Townships, Forest County,
Pennsylvania

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Acronyms and Abbreviations

ANF	Allegheny National Forest
ASL	Allegheny Snowmobile Loop
ATV	All-terrain Vehicle
BA	Biological Assessment
BCP	Brush Creek Project
BCPA	Brush Creek Project Area
BCRAP	Brush Creek Roads Analysis Process
BE	Biological Evaluation
BO	Biological Opinion
Ca	Calcium
CFR	Code of Federal Regulations
CE	Cumulative Effects
CWD	Coarse Woody Debris
DBH	Diameter at Breast Height
DEIS	Draft Environmental Impact Statement
DFC	Desired Future Condition
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FR	Forest Road
FY	Fiscal Year
GIS	Geographic Information System
HQ-CWF	High Quality Cold Water Fisheries
ID	Interdisciplinary
LRMP	Land and Resource Management Plan
MA	Management Area
MBF	Thousand Board Feet
Mg	Magnesium
MIS	Management Indicator Species
MMBF	Million Board Feet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFS	National Forest System
NNIS	Non-native Invasive Species
NWI	Nationally Inventoried Wetland
OGM	Oil, Gas, and Mineral
OHV	Off-highway Vehicle
NOI	Notice of Intent
PA DEP	Pennsylvania Department of Environmental Protection
PGC	Pennsylvania Game Commission
RAP	Roads Analysis Process
RFSS	Regional Forester's Sensitive Species
ROS	Recreation Opportunity Spectrum

RV	Recreational Vehicle
SL	Sensitivity Level
SR	State Route
TSL	Traffic Service Level
U.S.	United States
USDA-FS	United States Department of Agriculture-Forest Service
USDI-FWS	United States Department of the Interior-Fish and Wildlife Service
VQO	Visual Quality Objectives
WEPP	Water Erosion Prediction Project

Summary

The Marienville Ranger District of the Allegheny National Forest is proposing the following management activities for the Brush Creek Project (Alternative 3: 2006 proposed action):

- Harvest approximately 9 million board feet of timber on approximately 1,241 acres of National Forest land within the Marienville Ranger District.
- Create about 753 acres of early successional habitat utilizing even-aged management in Management Areas 1.0 and 3.0.
- Perform associated reforestation activities (see Table 1) to develop adequate advanced regeneration or to ensure that the stands become fully stocked.
- Perform wildlife habitat improvements on approximately 505 acres of National Forest land, install 13 nest boxes for wildlife, and place coarse woody debris (fell trees) in streams.
- Construct seven additional parking areas along the Loleta and Lamonaville roads.
- Construct approximately 6.0 miles of roads, including adding 1.5 miles of existing roads to the Forest Service road system, decommission approximately 3.0 miles of unneeded roads, and accomplish maintenance on over 17 miles of forest roads including applying limestone surfacing to approximately 0.5 miles of road. This would require expanding six existing stone pits (6 acres) and developing two new stone pits (4 acres)

This proposed action implements the 1986 ANF Land and Resource Management Plan or Forest Plan (USDA-FS 1986a), as amended, and the analysis in this environmental assessment is tiered to the Final Environmental Impact Statement (USDA-FS 1986b) and Record of Decision (USDA-FS 1986c) for the 1986 Forest Plan.

The **project and analysis area** encompasses the National Forest land on which management activities are proposed to occur and transportation proposals (timber haul roads and stone pits) outside of the project area. The project area contains approximately 10,248 acres of National Forest System and lies within portions of Management Area 1.0, 3.0, and 6.1.

An interdisciplinary team of Forest Service resource specialists chose the initial treatment areas from an analysis of existing conditions within the project area **(Purpose for the Action)**. Analyzing the land capability, existing conditions, and landscape needs, the team identified the need to manage individual stands within the project area to help achieve the desired future condition in the Forest Plan. This includes establishing regenerating stands, improving stand conditions for optimum tree growth, providing high quality hardwood timber, and improving wildlife habitat **(Need for the Action)**. Many of these stands have interfering understory vegetation that would require reforestation treatments, such as herbicide application or site preparation to facilitate the development of adequate advanced regeneration.

The interdisciplinary team also considered a no action alternative and developed a second action alternative, which address the issues (no new roads, fragmentation, and reduced final harvests near the Yeaney Development) identified during scoping. Alternative 2: 2003 Proposed Action, along with the 1998 and 1999 proposals that were distributed for public scoping, were considered but have been eliminated from detailed study because they can no longer be implemented due to changed understory conditions resulting from delay of the project. The proposed activities for the three alternatives are summarized in Table 1. The action alternatives are described in further detail in chapters 1 and 2. A summary of the effects for each alternative is included in chapter 4.

Both action alternatives would meet the purpose and need for action and together adequately address issues and concerns raised by the public.

Table 1. Activities Proposed for the Brush Creek Project by Alternative

Proposed Activities	Alt 1	Alt 3	Alt 4
Timber Harvest			
Even-Aged Harvests (total acres)	**0**	**1239**	**666**
Overstory Removal **(acres)**	0	15	0
Shelterwood Seed/Shelterwood Removal **(acres)**	0	687	309
Thinning **(acres)**	0	537	357
Salvage Harvests (total acres)	**0**	**2**	**2**
Salvage Only **(acres)**	0	2	2
Uneven-Aged Harvests (total acres)	**0**	**0**	**54**
Group Tree Selection **(acres)**	0	0	54
Volume			
MMBF	**0**	**9.0**	**5.0**
Reforestation Activities			
Herbicide **(acres)**	0	957	574
Site Preparation **(acres)**	0	732	365
Fencing **(acres)**	0	662	358
Planting **(acres)**	0	350	231
Tree Shelters **(acres)**	0	84	73
Fertilization **(acres)**	0	241	144
Release **(acres)**	0	919	537
Restore/Improve Upland Wildlife Habitat Activities			
Prescribe Burn **(acres)**	0	149	149
Regenerate Aspen **(acres)**	0	51	51
Plant Shrubs/Aspen/Conifers[1] **(acres)**	0	99	99
Establish Warm Season Grasses **(acres)**	0	5	5
Prune/Release Fruit Trees **(acres)**	0	83	83
Fencing/Tree Shelters **(acres)**	0	89	89
Enhance Savannah[1] **(acres)**	0	18	18
Place Nest Boxes **(structures)**	0	33	33
Restore/Improve Stream Habitat Activities			
Place Coarse Woody Debris in Streams **(miles)**	0	8	8
Plant Streamside Vegetation **(acres)**	0	9	9
Restore Wetland **(acres)**	0	2	2
Recreation Activities			
Construct additional parking areas along the Loleta and Lamonaville Roads **(number of sites)**	0	7	7
Transportation Activities			
Road Construction – New Corridor **(miles)**	0	4.5	0
Road Construction – Existing Corridor **(miles)**	0	1.5	1.5
Road Maintenance **(miles)**	0	17.3	17.3
Decommission Roads **(miles)**	0	3.0	3.0
Limestone Surfacing **(miles)**	0	0.5	0.5
Pit Expansion Areas **(number/acres)**	0	6/6	4/4
New Pit Development **(number/acres)**	0	2/4	1/2

[1] Includes 11 and 18 acres of herbicide application, respectively.

Chapter 1: Proposed Action and Purpose and Need

1.1 Introduction, Document Structure, and Public Input Process

The Forest Service has prepared this analysis and document in compliance with the National Environmental Policy Act of 1969 (NEPA), the Appeals Reform Act of 1993, and other relevant federal laws and regulations as part of the environmental assessment process for the Brush Creek Project (BCP). The environmental assessment (EA) discloses the proposed action, connected actions, issues, design features, mitigations, and analysis of the direct, indirect, and cumulative environmental impacts that would result if the proposed action or its alternatives (including no action) were implemented. This document has five parts:

- **Chapter 1: Purpose and Need for Action:** This section includes information on the history of the project proposal, the purpose and need for action, the agency's proposal for achieving that purpose and need, public involvement, issues, and alternatives considered but not analyzed in detail.
- **Chapter 2: Alternatives including the Proposed Action:** This section provides a more detailed description of the proposed action, the no action alternative, and one additional action alternative. The proposed action and its alternatives were developed based on responses to the purpose and need and issues identified during scoping. This chapter also summarizes and compares the outputs of the alternatives and provides a summary displaying the environmental effects (management indicators).
- **Chapter 3: Affected Environment:** This section provides a description of the present condition of the project area and the affected environment.
- **Chapter 4: Environmental Consequences and Cumulative Effects:** This section provides an analysis of environmental effects of the proposed action and its alternatives. This analysis is tiered to the Final Environmental Impact Statement (USDA-FS 1986b, FEIS) for the Allegheny National Forest Land and Resource Management Plan (USDA-FS 1986a, LRMP or Forest Plan).
- **Chapter 5: List of Preparers:** This section provides a list of agencies and persons consulted during the development of this environmental assessment.
- **Appendices:** The appendices provide further information on the project and the environmental analysis for the project.

Additional documentation regarding environmental effects may be found in the project file located at the Marienville Ranger District office in Marienville, Pennsylvania.

1.2 Tiering to the Final Environmental Impact Statement for the Allegheny National Forest Land and Resource Management Plan

The Allegheny National Forest (ANF) has tiered this EA to the FEIS (USDA-FS 1986b) and Record of Decision (USDA-FS 1986c) for the 1986 ANF Forest Plan, as amended.

Tiering is described in Forest Service Handbook (FSH) (1909.15) as a process of summarizing and incorporating by reference from other environmental documents of broader scope to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision (USDA-FS 1992, FSH 1909.15, Chapter 42.1). The handbook specifically notes that the Environmental Impact Statement (EIS) for a land and resource management plan is an example of a "broad" EIS prepared for a program or policy statement (USDA-FS 1992, FSH 1909.15, Chapter 22.31). The BCP is a project-level analysis. The scope of the EA is confined to addressing issues and possible environmental consequences of this project. It does not attempt to address decisions made at higher levels. It does, however, implement direction provided at those higher levels.

The Forest Plan is a programmatic document that implements the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). The Forest Plan implements NFMA by providing "for diversity of plant and animal communities based on the suitability and capability of the (ANF) in order to meet overall multiple-use objectives and within the multiple-use objectives of a land management plan" (16 USC 1604(g)(3)(B)).

The Forest Plan provides guidance for managing resources and uses on the ANF. All applicable laws, regulations, policies and national and regional direction, as detailed in the Forest Service Manual and Handbook, are part of Forest Plan direction. In the Forest Plan, goals and objectives present a picture of what the ANF should look like and what services, products, and experiences it would provide. Standards and guidelines provide direction for implementing projects and activities. Monitoring evaluates whether the goals and objectives are being met and determines if additional or different management direction is necessary.

The Forest Plan has divided the ANF into management areas (MA), and each MA has particular goals and objectives. The Brush Creek Project Area (BCPA) contains portions of MA 1.0 (2,061 acres), MA 3.0 (6,224 acres), and MA 6.1 (1,963 acres).

1.3 Background

The BCPA is located on the Marienville Ranger District of the ANF in northwestern Pennsylvania (see Map 1). The project is located in Millstone Township in Elk County and Barnett and Jenks Townships in Forest County. The area within the project boundary is approximately 10,347 acres. Of this amount, approximately 10,248 acres (99 percent) are National Forest land, which are being considered for management. The remaining 99 acres (1 percent) are private lands, which are not included in the management proposals.

The BCPA is generally located in the southeast quadrant of the ANF. The project is bounded on the north by Compartment 674 and State Route (SR), on the west by SR 66 and private land, on the south by Millstone Creek and Winlack Run. The eastern border can not described in relation to man-made features. The eastern boundary traverses northerly toward the Byromtown area (see Map 1).

Approximately 82 percent of the National Forest land within the BCPA consists of mature forest stands. During the past 10 years, there has been little management activity, other than routine and custodial maintenance activities, within the BCPA. Any activities approved in previous environmental analysis within the BCPA would also be implemented over the next several years. These activities will be included in the cumulative effects analysis.

Dispersed recreation is one of the many uses in the project area and includes snowmobiling, camping, hunting, hiking, fishing, and driving for pleasure. A section of the Allegheny Snowmobile Loop (ASL) Trail is located in the BCPA on Forest Road (FR) 130. There are no designated all-terrain vehicle (ATV) trails within the BCPA; however, illegal ATV and snowmobile use is occurring within the BCPA. A portion of the Loleta Recreation Area is within the BCPA.

The BCPA contains approximately 24 miles of state and township roads, 19 miles of oil and gas (OGM) or privately owned roads, and 20 miles of Forest Service system roads. A road analysis process (RAP) has been completed for the BCPA. The RAP analyzed the existing road system and its effects on the environment and provides road recommendations and opportunities that can be carried forward in the BCP and other future environmental analysis.

Oil and gas development has occurred throughout the BCPA. District records show that there are 54 active, inactive, or plugged wells within the project area. All of these wells are on National Forest lands.

1.4 Purpose for Action

The purpose of the BCP is to accomplish resource objectives to meet the overall management goals for the ANF, as established in the Forest Plan. The project area lies within portions of Management Areas (MA) 1.0 (2,061 acres), 3.0 (6,224 acres), and 6.1 (1,963 acres). Proposed activities are intended to meet Forest-wide and MA 1.0, 3.0, and 6.1 goals and objectives including:

Forest-wide Direction/Goals (USDA-FS 1986a, p 4-2 and 4-3):

- Provide for a sustained flow of timber.
- Maintain or increase opportunities for hunting wildlife game species through vegetative manipulation.
- Maintain or increase non-consumptive opportunities for game and non-game species through vegetative manipulation and maintain habitat for all existing native vertebrate species.
- Restore understory to obtain a broader diversity of flora and fauna.

Primary Purpose for MA 1.0 (USDA-FS 1986a, p 4-60):

- Emphasize habitat management for ruffed grouse and other wildlife species associated with early successional stages of forest habitat.
- Provide a high quality of wood fiber production.
- Provide a roaded natural setting for all types of dispersed recreation opportunities.

Primary Purpose for MA 3.0 (USDA-FS 1986a, p 4-82):

- Provide a sustained yield of high-quality Allegheny hardwood and oak timber through even-aged management.
- Provide a variety of age or size class habitat diversity from seedling to mature sawtimber of timber types.

- Emphasize deer and turkey in all timber types and squirrel in the oak type.
- Provide a Roaded Natural setting for all types of developed and dispersed recreation opportunities, with an emphasis on motorized recreation activities.

Primary Purpose for MA 6.1 (USDA-FS 1986a, p 4-82):

- Maintain or enhance scenic quality.
- Emphasize a variety of dispersed recreation activities in a Semi-Primitive setting.
- Emphasize wildlife species which require mature or overmature hardwood forests, such as turkey, bear, cavity-nesting birds, and mammals.

1.5 Need for Proposal

The Forest Plan describes the Desired Future Condition (DFC) for lands allocated to MAs 1.0, 3.0 and 6.1. There are several site-specific opportunities for vegetation and other natural resource management within the project area that would change or enhance present conditions and help to achieve the DFC described in the Forest Plan. An opportunity to enhance a resource is defined as a "need."

An interdisciplinary (ID) team of Forest Service resource specialists assessed the stands in the BCPA for possible silvicultural treatments, wildlife habitat improvements, and transportation needs based on the Brush Creek RAP (BCRAP) and an analysis of the BCPA, comparing existing conditions to desired future conditions as outlined in the Forest Plan and determined by land capability.

1.5.1 Manage Vegetation for Current Forest Plan Desired Future Condition

(A) There is need to maintain a diversity of age classes, including early age classes spatially distributed across the landscape in MA 3.0 within the BCPA (USDA-FS 1986a, pp 4-82 to 4-96). As existing young classes develop and mature into older age classes, there is a need to maintain a young age class component into the next decade.

(B) There is a need to maintain or enhance seedling, shrub, and herbaceous diversity in the BCPA where a legacy of selective browsing by deer has resulted in reduced understory diversity (USDA-FS 1986a, p 4-3).

(C) There is a need to provide early-successional habitat within MA 1.0. Currently only eight percent of MA 1.0 within the BCPA is in the 0-20 age class. Forest Plan direction calls for 40percent of MA 1.0 to be in this younger age class (USDA-FS 1986a, p 4-62).

(D) There is a need to provide for mature forest conditions and wildlife habitat in MA 6.1 (USDA-FS 1986 a, p 4-110) and late-successional habitat as part of the forest-wide landscape approach to providing late-successional habitat.

1.5.2 Improve Terrestrial Habitat

(A) Within MA 1.0 and 3.0, there is a need to provide a wide variety of habitat conditions across the landscape to meet the needs of game and non-game wildlife species and maintain or enhance species diversity and abundance within the BCPA (USDA-FS 1986a, pp 4-60, 4-65 to 4-67, 4-82, and 4-91).

(B) Within MA 6.1, there is a need to provide a predominately forested landscape that has an adequate distribution of age classes and habitat diversity to meet the needs of indicator species, game and non-game wildlife species, and species that require isolation (USDA-FS 1986a, pp 4-110, 4-116, and 4-118).

(C) There is a need to restore the forest shrub component to improve wildlife cover and forage conditions to meet the needs of game and non-game wildlife species (USDA-FS 1986a, pp 4-82, 4-91, and 4-110).

(D) There is a need to improve understory conditions in forest stands dominated by fern to provide stand structure and cover conditions preferred by game and non-game wildlife species (USDA-FS 1986a, pp 4-82, 4-91, and 4-110).

1.5.3 Improve Aquatic Habitat

(A) There is a need to improve aquatic habitat and channel stability within several streams in the BCPA because sections of these streams are lacking large in-stream coarse woody debris, aquatic habitat diversity, or vegetative cover to provide shade. Opportunities exist along these streams to improve in-stream conditions by directionally felling trees into the streams and/or planting woody vegetation along the stream banks (USDA-FS 1986a, p 4-3).

1.5.4 Market Wood Based Products for Local Economies

There is a need to provide timber to meet people's demand for wood products such as furniture, paper, fiber, and construction materials (USDA-FS 1986a, pp 4-2 to 4-3).

Demand for sawtimber from Allegheny hardwood species remains moderately strong, based on open market prices in the region and the number of bids on past ANF sales. Maintaining a consistent flow of Allegheny hardwood timber serves the demands of the public for wood products. Continued production of this renewable resource also meets statutory authority to provide wood products within the capability of the land and within Forest Plan (Multiple Use Sustained Yield Act 1960; National Forest Management Act 1976). Satisfying this demand and meeting the objective of a consistent flow of a renewable resource is compatible with and contributes to other Forest Plan objectives, such as forest health, diversity of forest stands, and maintenance and improvement of wildlife habitat.

1.6 Proposed Action

The following activities in **Table 2** are proposed to achieve the purpose and need for the BCP and the Forest Plan DFC.

Table 2. 2006 Proposed Action

Proposed Activities	
Timber Harvest	
Even-Aged Harvests (total acres)	**1239**
Overstory Removal **(acres)**	15
Shelterwood Seed Cut/Shelterwood Removal **(acres)**	687
Thinning **(acres)**	537
Salvage Harvests (total acres)	**2**
Salvage Only **(acres)**	2
Uneven-Aged Harvests (total acres)	**0**
Volume (MMBF)	**9**
Reforestation Activities	
Herbicide **(acres)**	957
Site Preparation **(acres)**	732
Fencing **(acres)**	662
Planting **(acres)**	350
Tree Shelter Installation **(acres)**	84
Fertilization **(acres)**	241
Release **(acres)**	919
Restore/Improve Wildlife Habitat	
Prescribe Burn **(acres)**	149
Regenerate Aspen **(acres)**	51
Plant Shrubs/Aspen/Conifers[1] **(acres)**	99
Establish Warm Season Grasses **(acres)**	5
Prune/Release Fruit Trees **(acres)**	83
Fencing/Tree Shelters **(acres)**	89
Create Savannah[2] **(acres)**	18
Place Nest Boxes **(structures)**	33
Restore/Improve Stream Habitat	
Place Coarse Woody Debris in Streams **(miles)**	8
Plant Streamside Vegetation **(acres)**	9
Restore Wetland **(acres)**	2
Recreation Activities	
Construct parking areas along the Loleta and Lamonaville Roads **(number)**	7
Transportation Activities	
Road Construction – New Corridor **(miles)**	4.5
Road Construction - Existing Corridor **(miles)**	1.5
Road Maintenance **(miles)**	17.3
Decommission Roads **(miles)**	3.0
Limestone Surfacing **(miles)**	0.5
Pit Expansion Areas **(number/acres)**	6/6
New Pit Development **(number/acres)**	2/4

[1] Includes 11 acres of herbicide application

[2] Includes 18 acres of herbicide application

Vegetation Treatments:
Past land uses and over 70 years of browsing by high deer populations have greatly altered plant diversity and structural conditions from that which would have occur naturally. As a result, interfering vegetation such as fern, grass, beech root sprouts, and striped maple dominate understory conditions in both forested and non-forested communities across the BCPA.

Even-aged regeneration activities would harvest stands, through one or two entries, and would initiate the growth of a new forest by allowing more sunlight to reach the forest floor. This would be accomplished through removal cuts and shelterwood/removal cut sequences in forest stands. To ensure the establishment of tree seedlings, reforestation activities such as fertilization, site preparation for natural regeneration, herbicide application, fencing, and planting could occur on these sites. Even-aged management prescriptions, in this project, would create 702 acres (nine percent of the BCPA) of 0-10 age class over the next decade.

In past environmental documents, five stands that were designated as potential old growth are now being proposed for timber harvest. Stands 4, 16, and 19 in compartment 659 and stands 27 and 31 in compartment 663 would no longer be considered as potential old growth.

Commercial thinning is proposed on 537 acres in stands of commercial size to reduce competition for light and nutrients improving the health and vigor of residual trees. Windthrown trees from the July 2003 storm event would be harvested on two acres of the BCPA. Table 3 lists the stands proposed for harvest, type of harvest, approximate acres, and associated reforestation treatments for each stand. The proposed action would result in an estimated 3 million board feet (MMBF) of timber during the first entry and 6 MMBF in the second entry, which should take place within the next 10 years.

Table 3. Proposed Stands and Silvicultural Treatments.

Comp	Stand	Acres	MA	Harvest Treatments[1]	Reforestation Treatments[2]
657	1	6	3	Thin	-
657	7	32	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	8	37	3	Thin	H/SP/F/P
657	10	21	3	Thin	-
657	23	18	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	37	45	3	Thin	F/P
657	38	22	3	SH Seed Cut/SH Removal	H/SP/P/R
657	50	16	3	SH Seed Cut/SH Removal	H/SP/P/R
657	51	3	3	Thin	H/F/P/R
657	55	3	3	Reforestation only	H/Fe/F/P/R
657	58	10	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	62	37	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	63	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
657	64	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
657	65	9	1	SH Seed Cut/SH Removal	H/SP/F/P/R
658	7	8	3	Reforestation only	H/Fe/F/P/R
658	14	40	3	SH Seed Cut/SH Removal	H/SP/F/P/R
658	17	11	3	SH Seed Cut/SH Removal	H/SP/F/P/R
658	24	17	3	SH Seed Cut/SH Removal	H/SP/F/P/R
658	36	3	3	Reforestation only	H/Fe/F/P/R
659	4	12	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
659	16	15	3	Overstory Removal	H/F/P/R
659	19	6	3	Thin	-
659	47	11	3	Reforestation only	H/Fe/F/P/R
659	48	3	3	Reforestation only	H/Fe/F/P/R
660	3	27	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
660	16	11	3	Reforestation only	H/Fe/F/P/R
660	25	4	3	Thin	
660	28	7	3	SH Seed Cut/SH Removal	H/SP/F/P/R
661	6	4	6.1	Thin	-
661	10	2	6.1	Salvage	H/SP/F/P/R
661	19	19	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	26	9	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	34	19	3	SH Seed Cut/SH Removal	H/SP/F/P/R
661	35	13	3	Thin	-
661	36	15	3	SH Seed Cut/SH Removal	H/SP/F/P/R
661	42	1	6.1	Thin	-
661	48	2	6.1	Thin	-
661	53	3	3	Thin	-
661	72	14	3	Thin	-
661	73	3	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R

Comp	Stand	Acres	MA	Harvest Treatments[1]	Reforestation Treatments[2]
661	74	3	3	Thin	-
661	75	2	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	77	7	3	Thin	-
661	78	19	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	80	4	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	81	2	6.1	Thin	-
661	86	6	6.1	Thin	-
661	87	28	3	SH Seed Cut/SH Removal	H/SP/F/P/R
661	88	10	3	Thin	-
661	89	12	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	90	24	3	Thin	-
662	10	20	6.1	Thin	-
662	15	10	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	24	13	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	27	14	3	Thin	-
662	30	23	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	35	38	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	42	18	1	Thin	-
662	53	8	1	Reforestation only	H/Fe/F/P/R
662	55	9	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	58	18	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	61	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	62	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	63	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	64	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	65	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	66	8	1	Reforestation only	H/Fe/F/P/R
662	70	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	71	4	1	Reforestation only	H/Fe/F/P/R
662	75	8	1	Reforestation only	H/Fe/P/R
662	79	12	1	Thin	-
662	80	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	108	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	116	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	117	16	1	Thin	-
662	118	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
663	4	38	3	Reforestation only	H/Fe/F/P/R
663	15	26	3	Thin	-
663	16a	8	3	Thin	-
663	16b	5	3	Thin	-
663	17a	8	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
663	17b	3	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R

Comp	Stand	Acres	MA	Harvest Treatments[1]	Reforestation Treatments[2]
663	18	25	3	Thin	-
663	19	34	3	Reforestation only	H/Fe/F/P/R
663	22	20	3	SH Seed Cut/SH Removal	H/SP/F/P/R
663	27	17	3	Thin	-
663	31	17	6.1	Thin	-
663	51	4	3	Reforestation only	H/Fe/F/P/R
663	52	25	3	Reforestation only	H/Fe/F/P/R
663	56	15	3	SH Seed Cut/SH Removal	H/SP/F/P/R
663	57	5	3	Reforestation only	H/Fe/F/P/R
663	60	12	6.1	Thin	-
664	2	14	3	SH Seed Cut/SH Removal	H/SP/F/P/R
664	8	25	3	Thin	-
664	10	31	3	Thin	-
664	13	33	3	Thin	-
664	30	10	3	Reforestation only	H/Fe/F/P/R
664	46	23	3	Thin	-
667	2	3	1	Thin	-
667	18	17	1	Thin	-
667	52	9	1	Reforestation only	H/Fe/F/P/R
667	53	6	1	Reforestation only	H/Fe/F/P/R
667	54	11	1	Reforestation only	H/Fe/F/P/R
673	26	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
673	33	10	1	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
673	110	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R

1. SH = Shelterwood
2. H = Herbicide, SP = Site Preparation, Fe = Fertilization, F = Fence or Tree Shelter Installation, P = Planting and R = Release

Wildlife Habitat Improvements:
Stream corridor surveys have identified approximately nine acres along streams that are lacking shrubs, conifer, or over-hanging vegetation capable of shading and protecting riparian areas. Vegetation has been lacking in these areas due to current recreational activities and past resource extraction practices, like “splash dams”, common in the late 1800’s and early 1900’s. As these dams were breached, water and large woody debris scoured stream corridors removing riparian vegetation. Various conifer and shrub species are proposed for planting in these riparian areas in order to improve stream thermal regulation, nutrient deposition, and cover. Directionally felling trees into streams is proposed for sections (approximately eight miles) of West Branch Millstone Creek, Brush Creek, Dry Run, Laurel Run, Log Run, and Winlack Run. Within these areas, trees would be felled into the streams to provide important habitat for aquatic life. About two acres of wetland restoration is being proposed. This would involve repairing a breach in an old beaver or splash dam.

Past logging and resulting deer populations have subsequently contributed to low vegetative diversity throughout much of the BCPA. Native shrubs, aspen, and conifer plantings are being proposeed on approximately 99 acres to provide more diverse forage and cover for wildlife. Approximately 51 acres of aspen regeneration is being proposed to benefit ruffed grouse and American woodcock. Pruning and release is proposed for about 83 acres of fruit trees to improve their vigor and fruit production.

Many savannahs within the BCPA are dominated by vegetation that is not preferred as food by wildlife. Felling trees (less than 16 inches in diameter at breast), applying herbicides, prescribed burning, and planting warm season grasses are being proposed to enhance about 18 acres of savannah habitat for wildlife. Prescribe fire is also being proposed on approximately 149 acres for hazardous fuel reduction and wildlife habitat improvements. Non-native, invasive plants are known to occur withinsome of these sites. Prescribed burning is a safe, effective tool that could benefit wildlife by eliminating undesirable vegetation, reducing duff layers, and cycling nutrients back into the soil. Upon completion of burning activities, some of these sites would be prepared to support plant species better suited for wildlife. Such vegetation would be provided from planting (including warm season grasses) or on-site seed sources.

Installation of fencing or tree shelters is being proposed to protect planted shrubs and tree seedlings until they become established or grow beyond the reach of the deer. Thirteen nesting/roosting boxes are being proposed to increase structural cover capacity for non-game species, such as songbirds and bats in upland habitats. Twenty squirrel nest boxes are being proposed to be placed in conifer stands and inclusions within hardwoods stands to increase knowledge related to the distribution and habitat for the northern flying squirrel.

Site-specific proposals are listed in the Table 4.

Table 4. Proposed Wildlife Habitat Improvements

Comp	Stand	Management Area	Acres	Treatment
657	25	3	36	Prescribe burn
657	52	3	2	Prescribe burn
657	52	3	2	Plant/fence shrubs
658	21	3	3	Plant aspen
659	12	3	4	Prune/release apple and crabapple trees
659	12	3	4	Regenerate aspen
659	13	3	-	Place two bat boxes
659	20	3	2	Prune/release apple trees
659	24	3	4	Regenerate aspen
659	25	3	1	Regenerate aspen
659	35	3	12	Prune/release apple trees
659	35	3	1	Regenerate aspen
659	35	3	4	Plant/fence shrubs and aspen
659	35	3	1	Plant conifers
659	35	3	2	Fence existing shrubs and apple trees
659	35	3	-	Place one eastern screech owl and three bluebird nest boxes
659	46	3	10	Prune/release apple trees
659	46	3	-	Place three blue bird boxes
659	50	3	2	Regenerate aspen
659	50	3	5	Plant/fence shrubs and conifers
659	50	3	-	Place one owl nest box
660	1	3	5	Plant shrubs, wetland vegetation, and conifers
660	1	3	4	Regenerate aspen
660	15	3	1	Regenerate aspen
661	-	3	7	Fence unique plant community
661	6	3	2	Prune apple trees
661	7	6.1	1	Prune apple trees

Comp	Stand	Management Area	Acres	Treatment
661	7	6.1	5	Regenerate aspen
661	7	6.1	4	Prescribe burn (multiflora rose)
661	10	6.1	2	Regenerate aspen
661	11	3	2	Regenerate aspen
661	11	3	6	Prune/release apple and crabapple trees
661	11	3	3	Plant shrubs
661	12	3	15	Prescribe burn
661	12	3	5	Plant/fence aspen and shrubs
661	13	3	6	Regenerate aspen
661	15	6.1	4	Plant/fence shrubs
661	16	6.1	2	Plant conifers
661	16	6.1	2	Prune/release apple and crabapple trees
661	16	6.1	3	Regenerate aspen
661	17	3	1	Regenerate aspen
661	23	6.1	1	Plant stream-side vegetation
661	23	6.1	2	Prune/release apple trees
661	42	6.1	3	Prescribe burn
661	42	6.1	3	Plant steam-side vegetation
661	47	3	8	Prune/release apple trees
661	47	3	1	Regenerate aspen
661	47	3	3	Replace tree shelters
661	50	6.1	1	Regenerate aspen
661	50	6.1	12	Prune/release apple and crabapple trees
662	8	6.1	4	Prune/release apple trees
662	19	3	10	Plant/fence shrubs
662	54	1	2	Plant shrubs
662	59	3	2	Plant/fence shrubs
662	66	1	11	Herbicide
662	66	1	11	Plant/fence aspen and shrubs
662	83	1	-	Place three bat boxes
662	83	1	2	Prune/release apple trees

Comp	Stand	Management Area	Acres	Treatment
662	83	1	3	Regenerate aspen
662	83	1	2	Plant/fence shrubs
662	114	3	16	Prune/release apple trees
662	114	3	3	Regenerate aspen
663	19	3	3	Plant/fence aspen
663	27	3	5	Prescribe burn
663	27	3	5	Plant/fence shrubs
664	12	3	5	Plant aspen
664	13	3	44	Prescribe burn
664	14	6.1	6	Regenerate aspen
664	18	6.1	18	Prescribe burn
664	18	6.1	18	Plant/fence shrubs
667	1,37,44 and 45	1	18	Create savannah, herbicide, establish warm season grasses
667	9	1	11	Prescribe burn
667	14	1	1	Plant/fence shrubs
673	3	3	3	Plant aspen
673	3	3	8	Prescribe burn
673	3	3	3	Plant/fence shrubs
673	3	3	5	Establish warm season grasses
673	3	3	2	Restore wetland
673	18	3	3	Prescribed burn
673	18	3	3	Plant stream-side vegetation.
673	29	6.1	1	Plant stream-side vegetation
673	58	6.1	1	Plant stream-side vegetation

Recreation Activities:
The construction of seven small (3-5 vehicles) parking areas is being proposed along Loleta and Lamonaville Roads. There are few parking areas along these roads, forcing people to park in the ditch or pull off the road. This is often a safety concern during hunting seasons. Six of the parking areas would be constructed in existing openings and the one would require clearing the vegetation from approximately 1/10 acre.

Transportation Activities:
Road construction is being proposed on approximately 6.0 miles within the project area for both short-term and long term management, primarily for vegetative management of National Forest land. Approximately 1.5 miles of road construction would use existing road corridors, such as OGM access roads, old temporary roads, or other unclassified roads. There is over 17 miles of

road maintenance proposed in the BCPA. Maintenance is defined as the ongoing upkeep necessary to retain or restore a road to its approved road management objective. It may include a variety of road activities such as roadside brushing, surfacing, culvert replacement, as well as the installation of sediment basin, and surface and ditch armoring. These activities will reduce sediment, maintain or improve water quality, and provide safe driving conditions for the forest user. Limestone surfacing would be used on approximately 0.5 miles of road and would be accomplished to meet fisheries guidelines, which would include road sections within 300 feet of riparian areas and areas where roads cross streams. Approximately six acres of stone pit expansion are proposed for the BCP and two new pits are proposed for development (about 4 acres).

Approximately 3.0 miles of roads will be decommissioned. Decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state. A road can be decommissioned by applying one or more of the following treatments: 1) blocking the entrance to a road (**block)**; 2) reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation (**re-vegetate);** 3) removing culverts, reestablishing former drainage patterns, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed (**removal);** 4) completely eliminating the roadbed by restoring natural contours and slopes (**re-contour)**; or 5) other methods designed to meet the specific conditions associated with the unneeded roads.

The section of FR760 proposed for decommissioning is to be **blocked**. The southern section of FR767 proposed for decommissioning is proposed to be **blocked** and **re-vegetated**. The remaining sections of road proposed for decommissioning would be **blocked**, **re-vegetated**, **removed** (culverts), and **re-contoured.**

Table 5. Transportation Proposals

Road Construction – New Corridor	Road Number	Miles
	FR130Ja	0.2
	FR157C	1.1
	FR387	0.7
	FR591	0.8
	FR760	1.7
Road Construction - Existing Corridor	**Road Number**	**Miles**
	FR130J	0.5
	FR880	1.0
Road Maintenance	**Road Number**	**Miles**
	FR157	2.4
	FR157A	0.6
	FR157B	1.1
	FR166	2.4
	FR166A	0.2
	FR166B	0.3
	FR166C	0.5
	FR166D	0.1
	FR376	0.2
	FR377	1.6
	FR379	1.4
	FR379A	0.2
	FR387	1.2
	FR559	0.7
	FR591	1.7
	FR760	1.1
	FR787	0.9
	FR788	0.1
	FR789	0.3
	FR834	0.2
	FR843	0.1
Road Decommissioning	**Road Number**	**Miles**
	FR157B	0.4
	FR166C	0.4
	FR760	0.4
	FR767	1.3
	NS16946	0.2
	NS27129	0.3
Limestone Surfacing	**Road Number**	**Miles**
	FR377	0.2
	FR559	0.3

Pit Expansion (existing)	Location	Acres of Expansion
	FR157B	1.0
	FR166B	1.0
	FR379	1.0
	FR767	1.0
	NS24723	1.0
	NS25601	1.0
Pit Development (new)	**Location**	**Acres of Development**
	FR131E	2.0
	FR592	2.0
New Road Closures	**Road Number**	**Type**
	FR130J	gate
	FR157C	gate
	FR880	gate

1.7 Decision to Be Made

The purpose of this EA is to provide the District Ranger, who is the Responsible Official, with sufficient information and analysis to make an informed decision about the Brush Creek project in response to the purpose and need for action. The District Ranger will also consider public input to this EA to decide the following:

1) Are there additional issues and/or alternatives that should be analyzed in detail?
2) Which of the alternatives would best move the Brush Creek project area toward the DFC outlined in the Forest Plan and purpose and need for action?
3) Would the proposed action and its alternatives pose any significant environmental impact to warrant the need for an environmental impact statement?

This project does not require proposing any amendments to the Forest Plan.

1.8 Public Involvement

The BCP was first scoped for an environmental assessment on May 5, 1998. Seventeen responses were received during the initial scoping period. Changes in forest direction resulted in the decision to accomplish an environmental impact statement (EIS). This resulted in a Notice of Intent (NOI) published in the Federal Register in early 1999. Scoping was again accomplished and eight additional responses were received during the 1999 scoping period. The project was then deferred due to changes in ANF priorities.

Another NOI was published in the Federal Register on March 7, 2003 and a third scoping period begun. A news release was published in several local newspapaers during this scoping period, and a scoping package was mailed to over 650 interested parties, including adjacent property owners, on March 4, 2003. Fifty-seven responses were received during the third scoping period. On June 28, 2003, the Marienville Ranger District conducted a tour of the BCPA. Additional comments and questions were received as a result of the public tour. The BCP was initially listed in the ANF Schedule of Proposed Actions in the fourth quarter of 1997 (October 1 to December 31) and has been listed in subsequent issues.

The NOI to accomplish an EIS for the BCP was withdrawn on November 8, 2006. It has been decided that an EA will be the basis for determining whether or not an EIS will be accomplished. On September 18, 2006, a form was sent to the individuals and organizations on the NEPA (#53) mailing list and those who submitted comments during the first three scoping periods or returned postcards asking for the final NEPA documents for the BCP. The form asked the recipients if they wished to stay informed about the BCP and how and when they wished to be informed about the progress of the project.

On October 5, 2006, a Public Comment Package for the 2006 Proposed Action and alternatives develop from scoping to date for the BCP were sent out to those individuals and organizations that responded to the "stay informed" form that they wish to receive it. On October 5, 2006, the Public Comment Package was posted to the ANF website and an email message was sent to those individuals and organizations that asked to be notified electronically when the Public Comment Package was available on the ANF website or had submitted comments electronically for the BCP in the past. A news release was sent to local newspapers and other media on October 6, 2006 announcing the beginning of the formal 30-day comment period and availability of the Public Comment Package for the BCP. Also on October 6, 2006, a legal ad was published in *The Kane Republican* announcing the beginning of the formal 30-day comment period for the BCP

With the Public Comment Package, the Forest Service re-scoped for public input on the revised proposed action (2006) and the alternatives developed based on scoping to date. At the same time, sufficient information and analysis was provided within the Public Comment Package to allow the public to submit site specific comments on the proposed action and its alternatives.

The responses received during the scoping and 30-day comment periods have been used to identify issues, guide the analysis, and develop an additional action alternative. For a summary of the scoping comments received, please see Appendix A. For a response to the 30-day comments received, please see Appendix C.

1.9 Issues Used to Develop Alternatives

Comments received during scoping and 30-day comment periods were analyzed to determine if there were any issues that would affect the proposed action and the range of alternatives to be considered; and

- whether they could be or have been addressed at a higher (forest, regional, national) level, or;
- whether they can be resolved by applying Forest Plan standards and guidelines, or;
- whether they can be resolved by modifying the proposed action.

Issues were separated into significant and non-significant issues. Non-significant issues are identified as those:

- outside the scope of the proposed action;
- already decided by law, regulation, Forest Plan, or other higher level decision;
- irrelevant to the decision to be made; or
- conjectural and not supported by scientific or factual evidence.

The Council on Environmental Quality NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have

been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant issues and their categorization as non-significant may be found in Appendix A.

Three significant issues were identified from scoping:

1. **Impacts of road management changes for access and resource protection.**

   There is concern that road construction and and stone pit development/expansion and associated timber harvests would negatively impact soils, water, wildlife species, and opportunities for solitude within the project area. Some people want more roads decommissioned and less access to enhance remoteness and opportunities for solitude within the project area, as well as minimizing the disturbances (including disturbances to wildlife) associated with motorized vehicles.

   Measure: Miles of new road construction.
   Measure: Miles of road decommissioning.
   Measure: Road density (miles of road per square mile).
   Measure: Road management changes (percent of open, closed, and restricted roads).

2. **Impacts of proposed activities on unroaded areas, habitat connectivity, and fragmentation within the project area.**

   There is concern that road building and timber harvesting would result in increased fragmentation and reduced habitat connectivity within the project area and this would result in negative impacts to wildlife, including interior songbirds. There is concern about that road building would impact the unroaded areas (greater than 500 acres) identified in the Forest Roads Analysis.

   Measure: Acres of late-successional forest.
   Measure: Acres of unfragmented forest.
   Measure: Size of unroaded areas square mile (acres).

3. **Impacts to Yeaney Development.**

   Private landowners within this development have concerns about the level of timber harvesting and other proposed activities near their camps. They are concerned that the proposed activities combined with past activities would leave their camps surrounded by cutover land.

   Measure: Acres of final harvest adjacent or near the Yeaney Development.

1.10 Relationship to Other Documents

The Forest Plan is just one of the environmental documents which provide guidance or information regarding management within the Brush Creek project area. This analysis is also tiered to the following documents:

- *The Understory Vegetative Management Final Environmental Impact Statement (VMEIS) and Record of Decision (USDA-FS 1991a).* This document analyzes the use of herbicides to control interfering understory vegetation.
- *Final Environmental Impact Statement for Threatened and Endangered Species on the Allegheny National Forest (USDA-FS 2000a).* The purpose of this analysis is to address

the maintenance and enhancement of habitat on the ANF needed to ensure the continued existence of five Threatened and Endangered species.

- *Vegetation Management on Electric Utility Rights of Way Final Environmental Impact Statement and Record of Decision (USDA-FS and Environmental Consultants, Inc. 1997).* The purpose of this EIS is to evaluate the appropriateness of using herbicides to manage vegetation and disclose potential environmental impacts of the vegetation treatment alternatives on National Forest land on the ANF.

The following documents are incorporated by reference:

- *The Allegheny National Forest Monitoring and Evaluation Reports from Fiscal Year (FY) 1987 to 2001.* The purpose of monitoring and evaluation is to determine progress in meeting Forest Plan direction. Monitoring and evaluation provides information to determine whether Forest Service programs are meeting the Forest Plan direction, which includes goals and objectives, management prescriptions, and standards and guidelines.
- *Brush Creek Roads Analysis Project Report (USDA-FS 2004a).* This report contains recommendations that may be carried forward in the Brush Creek and other projects.
- *Draft Environmental Impact Statement for 2006 Allegheny National Forest Land and Resource Management Plan, Appendix G (USDA-FS 2006a).* This appendix to the 2006 Forest Plan DEIS documents the potential human health effects and probable effects on wildlife, terrestrial plants, and aquatic species from using herbicides for vegetation management on the ANF.

Consistency with the Forest Plan applies only to the specific activities described in the action alternatives. Not all desired conditions in the Forest Plan can be achieved with a single on-the-ground action. Often many actions are necessary in order to meet the desired future conditions identified by management direction.

1.11 Consulting Agencies

The Forest Service works in close cooperation with the U.S. Fish and Wildlife Service (USDI-FWS). In December 1998, the ANF entered into formal consultation with the USDI-FWS with regard to the potential effects of implementation of activities outlined in the Forest Plan on five federally threatened and endangered species. Formal consultation was concluded on June 1, 1999, when the USDI-FWS issued its Biological Opinion (BO) (USDI-FWS 1999). The Forest Plan has been amended to be fully compliant with the BO. All management activities proposed in the BCP are subject to, and will meet, the terms and conditions of the BO. Additionally, the USDI-FWS will be consulted prior to implementation of any activities proposed under the BCP.

The Forest Service also consults with the Pennsylvania Historical and Museum Commission (State Historic Preservation Office in Pennsylvania) and the Seneca Nation of Indians Tribal Historic Preservation Office in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, and the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation. All management activities proposed in the BCP will be reviewed by both of these agencies for potential impacts to heritage resources.

Chapter 2: Alternatives

2.1 Description of Alternatives to be analyzed in Detail

2.1.1 Alternative 1: No Action

While this alternative does not meet the purpose and need for action, it does provide a basis for analyzing the effects of not conducting management activities in the BCPA and comparing the effects with those of the action alternatives. The no action alternative is required by the NEPA. The proposed timber harvests, reforestation activities, wildlife habitat improvements, and transportation proposals would not be completed at this time, and only routine custodial or maintenance activities would occur in the BCPA. This alternative would allow ecological processes and conditions to control the development of vegetation within the BCPA.

2.1.2 Alternative 2: 2003 Proposed Action

This alternative, along with the 1998 and 1999 proposals that were distributed for scoping, were considered but eliminated from detailed study because they can no longer be implemented due to changed understory conditions resulting from delay of the project.

2.1.2 Alternative 3: 2006 Proposed Action

Alternative 3 is described in detail in chapter 1, section 1.6

2.1.3 Alternative 4

This alternative was developed to addresses the significant issues listed in chapter 1, section 1.9. The overall approach is to implement management activities while minimizing the effects of fragmentation. This results in a 40 percent (519 acres) reduction in timber harvest from that proposed in Alternative 3 and implement about 54 acres of uneven-aged harvests instead of even-aged harvests. Some timber harvests would require utilizing long skids depending on the type, size, and location of the proposed vegetation treatment. No new road construction would take place, except for adding existing road corridors (proposed Forest Roads 130I and 880) to the Forest Service road system. Less stone would be needed, which would result in less pit expansion and development. Road maintenance, road decommissioning, wildlife habitat improvements, and recreation proposals would occur as proposed in Alternative 3. No final harvests are proposed adjacent to or near the Yeaney Development. Proposed silvicultural treatments for Alternative 4 are listed in Table 6.

Three stands that were previously designated as potential old growth are also proposed for timber harvests in this alternative and include stand 19 in compartment 659 and stands 27 and 31 in compartment 663.

The following stands were dropped from treatment in Alternative 4 due to no new road construction (access) and to minimize fragmentation:

- Compartment 657, Stands 37, 38, and 50
- Compartment 658, Stands 14 and 24
- Compartment 661, Stands 19, 87, 88, and 90
- Compartment 664, Stands 10, 13, and 46

The following stands were dropped from treatment in Alternative 4 to minimize fragmentation:

- Compartment 660, Stands 3
- Compartment 661, Stand 34 and 89
- Compartment 662, Stands 10 and 35
- Compartment 664, Stand 2

The following stands were dropped from treatment in Alternative 4 to limit even-aged final harvests north of State Routes (SR) 2005 and 3002.

- Compartment 658, Stand 17
- Compartment 659, Stands 4 and 16
- Compartment 660, Stands 25 and 28
- Compartment 661, Stands 26, 73, 75, and 89
- Compartment 663, Stands 16a, 16b, 17a, 17b, and 56

Three stands were changed from even-aged management to uneven-aged management in Alternative 4.

- Compartment 661, Stands 36 and 78
- Compartment 663, Stand 22

Table 6. Proposed Silvicultural Treatments for Alternative 4

Comp	Stand	Acres	MA	Harvest Treatments[1]	Reforestation Treatments[2]
657	1	6	3	Thin	-
657	7	32	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	8	37	3	Thin	H/SP/F/P
657	10	21	3	Thin	-
657	23	18	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	51	3	3	Thin	H/F/P/R
657	55	3	3	Reforestation only	H/Fe/F/P/R
657	58	10	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	62	37	3	SH Seed Cut/SH Removal	H/SP/F/P/R
657	63	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
657	64	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
657	65	9	1	SH Seed Cut/SH Removal	H/SP/F/P/R
658	7	8	3	Reforestation only	H/Fe/F/P/R
658	36	3	3	Reforestation only	H/Fe/F/P/R
659	19	6	3	Thin	-
659	47	11	3	Reforestation only	H/Fe/F/P/R
659	48	3	3	Reforestation only	H/Fe/F/P/R
660	16	11	3	Reforestation only	H/Fe/F/P/R
661	6	4	6.1	Thin	-
661	10	2	6.1	Salvage	H/SP/F/P/R
661	26	9	3	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
661	35	13	3	Thin	-
661	36	15	3	Group Selection	H/SP/F/P/R
661	42	1	6.1	Thin	-
661	48	2	6.1	Thin	-
661	53	3	3	Thin	-
661	72	14	3	Thin	-
661	74	3	3	Thin	-
661	77	7	3	Thin	-
661	78	19	3	Group Selection	H/SP/Fe/F/P/R
661	81	2	6.1	Thin	-
661	86	6	6.1	Thin	-
662	10	20	6.1	Thin	-
662	15	10	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	24	13	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	27	14	3	Thin	-
662	30	23	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	42	18	1	Thin	-
662	53	8	1	Reforestation only	H/Fe/F/P/R
662	55	9	1	SH Seed Cut/SH Removal	H/SP/F/P/R

Comp	Stand	Acres	MA	Harvest Treatments[1]	Reforestation Treatments[2]
662	58	18	3	SH Seed Cut/SH Removal	H/SP/F/P/R
662	61	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	62	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	63	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	64	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	65	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	66	8	1	Reforestation only	H/Fe/F/P/R
662	70	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	71	4	1	Reforestation only	H/Fe/F/P/R
662	75	8	1	Reforestation only	H/Fe/P/R
662	79	12	1	Thin	-
662	80	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	108	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	116	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
662	117	16	1	Thin	-
662	118	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
663	4	38	3	Reforestation only	H/Fe/F/P/R
663	15	26	3	Thin	-
663	18	25	3	Thin	-
663	19	34	3	Reforestation only	H/Fe/F/P/R
663	22	20	3	Group Selection	H/SP/F/P/R
663	27	17	3	Thin	-
663	31	17	6.1	Thin	-
663	51	4	3	Reforestation only	H/Fe/F/P/R
663	52	25	3	Reforestation only	H/Fe/F/P/R
663	57	5	3	Reforestation only	H/Fe/F/P/R
663	60	12	6.1	Thin	-
664	8	25	3	Thin	-
664	30	10	3	Reforestation only	H/Fe/F/P/R
667	2	3	1	Thin	-
667	18	17	1	Thin	-
667	52	9	1	Reforestation only	H/Fe/F/P/R
667	53	6	1	Reforestation only	H/Fe/F/P/R
667	54	11	1	Reforestation only	H/Fe/F/P/R
673	26	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R
673	33	10	1	SH Seed Cut/SH Removal	H/SP/Fe/F/P/R
673	110	10	1	SH Seed Cut/SH Removal	H/SP/F/P/R

1. SH = Shelterwood

2. H = Herbicide, SP = Site Preparation, Fe = Fertilization, F = Fence or Tree Shelter Installation, , P = Planting and R = Release

Table 7. Transportation Proposals for Alternative 4

Road Construction – Existing Corridor	**Road Number**	**Miles**
	FR130J	0.5
	FR880	1.0
Road Maintenance	**Road Number**	**Miles**
	FR157	2.4
	FR157A	0.6
	FR157B	1.1
	FR166	2.4
	FR166A	0.2
	FR166B	0.3
	FR166C	0.5
	FR166D	0.1
	FR376	0.2
	FR377	1.6
	FR379	1.4
	FR379A	0.2
	FR387	1.2
	FR559	0.7
	FR591	1.7
	FR760	1.1
	FR787	0.9
	FR788	0.1
	FR789	0.3
	FR834	0.2
	FR843	0.1
Road Decommissioning	**Road Number**	**Miles**
	FR157B	0.4
	FR166C	0.4
	FR760	0.4
	FR767	1.3
	Non-System	0.3
	Non-System	0.2
Limestone Surfacing	**Road Number**	**Miles**
	FR377	0.2
	FR559	0.3
Pit Expansion (existing)	**Location**	**Acres of Expansion**
	FR157B	1.0
	FR166B	1.0
	FR379	1.0
	FR767	1.0

Pit Development (new)	Location	Acres of Development
	FR592	2.0
New Road Closures	**Road Number**	**Type**
	FR130J	gate
	FR880	gate

2.1.4 Design Features and Mitigation Measures Common to All Action Alternatives

The proposed action, including herbicide application, has been designed to be implemented in accordance with the Forest Plan forest-wide and MA 1.0, 3.0, and 6.1 specific standards and guidelines (USDA-FS 1986a) and the Soil Interim Guidelines (USDA-FS 2001a).

Design Features are highlighted applications of the Forest Plan standards and guidelines. In some cases, the standards and guidelines provide options for how they may be applied. A design feature clarifies, where necessary, how these standards and guidelines may apply to specific actions in the project proposal. Design features for the action alternatives include:

Soils and Water:

- Maintain water body buffers as follows during layout and implementation of harvest activities: a zone of no heavy equipment activity operation will be enacted at least 50 feet plus 2 feet for 1 percent of slope on each side of any intermittent stream; at least 100 feet or 50 feet plus 4 feet for every 1 percent of slope, whichever is greater, on each side of any perennial stream; and at least 25 feet of wetlands, except for facility, trail, and road maintenance (*USDA-FS 1986a, pp 4-19 and 24; PA DCNR 2003; PA DEP 2005*).
- Trees should not be removed within 10 feet of stream channel banks except for road construction or trail or road maintenance (*USDA-FS 1986a, p 4-24; PA DEP 2005*).
- Trees should not be removed within 25 feet of wetlands, including springs and seeps. From 25 feet to 100 feet, maintain at least an average of 50 percent canopy cover (*USDA-1986a, pp 4-19, 4-31, 4-65, 4-90, and 4-118; PA DCNR 2003*).
- Heavy equipment operation within riparian corridors, within 25 to 100 feet of wetlands should utilize low ground pressure (less than 15 p.s.i. loaded contact pressure with zero inches of penetration) and occur during proper site conditions (dry or frozen) to avoid rutting. Heavy equipment restrictions do not apply to facility, trail, and road maintenance or stream crossing construction, but impacts to riparian corridors should be minimized or rehabilitated (*USDA-1986a, pp 4-19, 4-31, 4-65, 4-90, and 4-118; USDA-FS 2001, p 4-22*).
- Trees should be felled away from streams and wetlands. Logs should not be skidded through no-cut buffers. (*USDA-FS 1986a, pp 4-19 and 4-24; PA DCNR 2003*).
- Reuse existing skid trails and landings as practicable to minimize new disturbance (*USDA-FS 1986a, p 4-23*).
- Use culvert and waterbar spacing guides for road drainage as necessary on roads proposed for construction, maintenance, and decommissioning *(USDA-FS 1986a, p 4-26 and 4-27).*

Vegetation:

- If northeastern bulrush or small whorled pogonia plants or populations are found during project implementation, any activities that may cause impacts within 300 feet of the area of influence surrounding the plants and/or populations will be halted and the Fish and Wildlife Service will be consulted to determine and implement appropriate site-specific conservation measures before resuming activities *(USDA-FS 1986a, p 4-37).*
- Prior to ground-disturbing and/or vegetation management activities, habitat for northeastern bulrush and small whorled pogonia should be evaluated and/or surveyed to determine suitable habitat and/or occupation *(USDA-FS 1986a, p4-37).*
- If a butternut tree is found, the tree would be assessed to determine whether it has been affected by the canker. If the tree appears to be resistant, activities that promote seed germination such as release and fencing could be implemented. *(USDA-FS 1986a, p. 4-6 and 4-37).*

Wildlife:

- In all timber harvest units:
    - One-quarter acre reserve areas should be set aside for each five acres of timber harvest. Layout of reserve areas should emphasize the following: vernal ponds, wet depressions, unique plant communities, rock complexes, den trees, snags, conifers, mast producing species, and tree and shrub species that are minor components of the stand. Additional live and dead trees scattered throughout the timber harvest units should be retained *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38)*.
    - Retain trees with characteristics of suitable bat roosts (dead or dying trees with flaking or exfoliating bark) whenever possible *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38).*
    - Retain all shagback hickory *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38).*
    - Retain at least three live trees per acre greater than or equal to 20 inches DBH (or largest trees available) of preferred roost tree species. Where possible, these trees should be located in areas of the stand where thick regeneration that occurs after a final harvest will not shade or obstruct flight to the tree. Retain an additional six live trees per acre greater than 10 inches DBH *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38)*.
- In stand 661010, retain at least nine snags per acre greater than 10 inches in DBH (where available) *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38).*
- If any Indiana bat maternity roost trees are discovered, the roost trees will be protected from physical disturbance and an area of use will be designated based on site conditions, radio-tracking, or other survey information and best available information regarding maternity colony needs. The site will be maintained or enhanced by maintaining an adequate number of snags, including known roost trees; maintaining large live trees to provide future roosting opportunities; and maintaining optimal roosting and foraging habitat. Within the area of use (known or likely foraging or roosting) determined for each

maternity colony, conduct prescribed burning only during the hibernation season *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38)*.

- If occupied Indiana bat male roost trees are discovered during the summer season, protect them from physical disturbance by designating a 75-foot radius buffer zone around the tree(s). Within the buffer zone, no ground disturbing activity, prescribed fire, or timber harvest should occur. The buffer zone should remain in place until the roost tree naturally falls to the ground. Protect know male roost trees from physical disturbance until they naturally fall to the ground *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38).*
- Remove hazard trees between October 15 and April 1, whenever possible *(USDA-FS 1986a, pp 4-37, 4-37c, and 4-38).*
- Retain mature and over-mature (super-canopy) white pine and any super-canopy, heavy crowned hardwood trees (especially long-lived species) that could serve as potential eagle nest and roost sites on the slopes facing the East and West Branches of Millstone Creek and Scott Run *(USDA-FS 1986a, pp 4-32, 4-37, 4-66, 4-92, and 4-120)*.
- Maintain existing conifer component and retain all conifers greater than 18 inches in diameter at breast height (DBH) *(USDA-FS 1986a, pp 4-32, 4-37, 4-66, 4-92, and 4-120).*
- Near rock outcrops and boulder fields, protect the integrity of potential den sites by not impacting rocks larger than 2 feet in diameter and by not creating excessive soil disturbance (*USDA-FS 1986a, p 4-37*).
- Prescribed burning shall occur between October 15 and April 15 *(USDI-FWS 1999a, p 53)*.
- Foams (fire suppressant) will not be used in areas in close proximity to wetlands, streams, and aquatic life *(USDA-FS 1986a, p 4-19 and 4-24)*.
- Potential bat roosting trees (snags) will be identified and protected with “wet lines” or raking fuel from around snags with loose bark, cracks, and/or cavities *(USDA-FS 2000a, Appendix G, pp 4-37c and 4-38)*.

Heritage Resources:

- Site-specific areas are not listed where heritage sites occur due to the confidential nature of the information. See Forest Plan pages 4-10, 4-75, 4-86, 87, and 4-115 for management area direction discussing heritage resources. Appropriate heritage resources personnel will be contacted prior to formalizing any sale or implementation contract concerning ground disturbing activities to include any mitigation measures that will be included in contract clauses or agreements to protect heritage sites. Also, in any contract or agreement a statement will reflect the following: If any previously unrecorded sites are found during project implementation, all activity in the area should cease and the appropriate heritage resources personnel should be contacted. A heritage resource specialist will evaluate the situation and determine the proper course of action (*USDA-FS 1986a, pp 4-10, 4-75, 4-86, 4-87, and 4-115*).

Scenery and Recreation:

- Tree marking paint will be applied on the side away from visually sensitive roads (SR 2005 and SR 3002) so paint will not be visible in stands: 657001, 658017, 662035, 662065, 662079, and 662080 (*USDA-FS 1986a, pp 4-63, 4-87 and 4-115*).
- Place a 100 foot no-harvest buffer zone along SR 2005, SR 3002, and FR 130. Roadside openings shall be no larger than 400 feet and spaced no less than 1000 feet apart. Buffer and roadside openings will be located in the field by landscape architect. This design feature will be used on the following stands: 658017, 661036, 662065, and 662080 (*USDA-FS 1986a, pp 4-63, 4-87, and 4-115*).
- A 100-foot buffer shall be left between sensitivity level 1 roads (SR 2005 and SR 3002) and the treatment unit where herbicide and fencing is prescribed. Affected stands include: 658017, 662035, 662065, and 662080 (*USDA-FS 1986a, pp 4-63, 4-87, and 4-115*).
- For visually sensitive roads (SR 2005 and SR 3002), slash shall be pulled back 25 feet from the edge of road and for an additional distance of 75 feet, slash shall be lopped and scattered to a depth of 3 feet (*USDA-FS 1986a, pp 4-63, 4-87, and 4-115*).
- Along FR 130 (T-327), slash shall be pulled back 15 feet from the edge of the road, and for an additional distance of 35 feet, slash shall be lopped and scattered to a depth of 3 feet (*USDA-FS 1986a, pp 4-63, 4-87, and 4-115*).
- Fencing will be kept 50 feet from all trails or sensitivity level 2 roads (FR130) (660025, 660028, 661036, and 661080) (*USDA-FS 1986a*, *pp 4-63, 4-87, and 4-115*).
- Log landings shall not be visible from visually sensitive roads (SR 2005 and SR 3002), wherever possible. This shall be achieved by entering the stand from the rear of the unit. If this is not possible, log landings shall be located at least 100 feet away from the road/trail, and preferably out of sight and behind vegetation or landforms that have a screening effect. All debris and slash at the landing shall be removed once the harvest is completed. Landings shall be smoothed, limed, fertilized, and seeded when logging is complete to reduce the visual impact (*USDA-FS 1986a, pp 4-63, 4-87, and 4-115*).
- Disturbed soils within 100 feet of sensitivity level 1 roads (SR 2005 and SR 3002) will be seeded and mulched (657001, 658017, 662035, 662065, 662079, and 662080) (*USDA-FS 1986a*, *pp 4-63, 4-87, and 4-115*).
- No felling, skidding, or hauling will be permitted during March 1 to April 30 and September 15 to November 30 on the days of the bird dog trial event within the event area (MA 1.0). Affected stands include: 657023, 657063, 657064, 657065, 662030, 662042, 662053, 662055, 662061, 662062, 662065, 662066, 662070, 662071, 662079, 662080, 662108, 662116, 662117, 662118, 673026, 673033, and 673110 *(USDA-FS 1986a, p 4-64)*.
- No timber hauling will be permitted on weekends from noon Friday until 5:00 am Monday or on holidays from the Friday before Memorial Day through Labor Day on FR 157 (*USDA-FS 1986a, p 4-95).*
- Hauling, road maintenance or felling and skidding activities within 100 feet of the snowmobile trails (FR 130 and 131) will not be permitted Friday through Sunday on

December 20 to April 1 during the winter activity season when conditions are favorable to snowmobiling. At other times, commercial and administrative traffic will run with their lights on during favorable snow conditions *(USDA-FS 1986a, p 4-95)*.

- Snowplowing activities on FR 130 and FR 131 will leave a 2-4 inch mat to protect the road surface (*Timber Sale Contract Clause CT5.33*).

Mitigation measures are necessary when a specific situation requires Forest Plan standards and guidelines be exceeded to avoid potentially significant effects. A **monitoring plan** for mitigations listed below is found in Appendix B of this document.

Soils and Water:

- There will be no skidding and movement of machinery through spring seeps and stream channels. Skid trails and landings will be located away from the head of any seep. Appropriate erosion control methods will be implemented to minimize movement of silt into any seep (*Exceeds Forest Plan standards and guidelines, pp 4-24 and 4-31*).
- On Group 2 soils, main skid trails should occupy less than 10 percent of the stand. Existing main skid trails should be used whenever possible to reduce additional impacts (*Exceeds Forest Plan standards and guidelines, pp 4-21and 4-22*).
- For stands where inclusions of wet soils (drainage Group 2 or 3) are found, the following shall apply: 1) All heavy equipment (including feller-bunchers) will be excluded from wet soils inclusions less than 1 acre; 2) Main skid trails should be kept out of wet soil inclusions > 1 acre whenever possible. The stand-level measures identified above will apply where skid trails must be located within wet soil inclusions (*Exceeds Forest Plan standards and guidelines, pp 4-21 through 23*).
- Trees should not be removed within 100 feet of the high water mark of vernal pools**,** except for facility, trail, and road maintenance. Heavy equipment operation should be excluded within 100 feet of vernal pools. From 100 to 200 feet, maintain at least an average of 50 percent canopy cover to protect amphibian habitat. Heavy equipment use should utilize low ground pressure (less than 15 p.s.i. loaded contact pressure with zero inches of penetration) and occur during proper site conditions (dry or frozen) within 100 to 200 feet of vernal pools. Heavy equipment restrictions do not apply to facility, trail, and road maintenance or stream crossing construction, but impacts to riparian areas should be minimized or rehabilitated (*Exceeds Forest Plan standards and guidelines, pp 4-19, 4-20, and 4-23 through 4-25; USDA-FS 2001, p 4-22*).
- Road drainage outlets will be designed to a standard that prevents accelerated erosion on all roads proposed for construction or maintenance. (*Exceeds Forest Plan standards and guidelines, p 4-26*).

Vegetation:

- Retain scale-free or lightly infested beech to provide for mast and snag recruitment. Healthy beech should have full, healthy crowns, tight smooth bark, and no rot or cavities. They should not exhibit any scale (or only have light scale present), fungus, crown dieback, tarry spots, or puckered bark (*Exceeds Forest Plan standards and guidelines, pp 4-29 and 4-48).*

Non-Native Invasive Species:

- In order to reduce the occurrence of non-native invasive species (NNIS) and minimize the risk of spread into other areas, areas of infestation will be mapped and on sites where infestation has been documented equipment used in timber harvesting or reforestation activities will be cleaned prior to the arrival and upon departure of all treatment areas (*Timber Contract Clause - Specific to Project Area).*

Wildlife:

- Site preparation and non-commercial release cuts would be conducted outside the period of April 1 to June 30, to avoid possible impacts to nesting songbirds *(Exceeds Forest Plan forest-wide standards and guidelines, p. 4-17).*

2.2 Alternatives Considered But Eliminated From Detailed Study

Several alternatives were considered by the ID team and responsible official but were eliminated from detailed study for various reasons. The following are those alternatives:

1. **Alternative 2: 2003 Proposed Actions:** This alternative, along with the 1998 and 1999 proposals that were distributed for scoping, were considered but eliminated from detailed study because they can no longer be implemented due to changed understory conditions resulting from delay of the project and additional fieldwork.
2. **Zero Cut/No Logging Alternative:** This alternative was considered but eliminated from detailed study because it does not meet the Forest Plan objectives to move the BCPA towards the desired future condition outlined in the Forest Plan. An alternative that analyzes no logging or no commercial harvesting and only restoration would not address the purpose and need identified for this project. Additionally, this alternative embodies a national issue, and therefore, is beyond the scope of this analysis. The effects of not managing vegetation are analyzed in Alternative 1: No Action. Restoration proposals, such as planting native species, road decommissioning, etc. are included in the Proposed Action.
3. **Restore Pre-Settlement Forest Conditions Alternative:** The ANF has been profoundly altered from the initial conditions present before the European settlement of western Pennsylvania. Since that time and projecting into the future, the ANF has suffered and probably will continue to suffer serious declines in species that were once dominant in the area (passenger pigeon, American chestnut, American beech, eastern hemlock, and sugar maple) primarily due to insect infestations and disease (except for the passenger pigeon) beyond the ANF's control. This alternative was eliminated from detailed study because it can not be implemented.
4. **Recreation Only Alternative:** This alternative was eliminated from detailed study because it is beyond the scope of the project and would not address the purpose and needs for this project.
5. **No Herbicide Application Alternative:** The Forest Plan and Final Environmental Impact Statement for Understory Vegetation Management (USDA-FS 1991a) reviewed alternatives to using herbicides and concluded that herbicides are the most effective and

least costly and meet soil, water, health, and safety criteria (USDA-FS 1991a, Appendix G, p. 29)

6. **Exclusive Use of Uneven-aged Management:** This alternative was eliminated from detailed study because Forest Plan direction for MA 1.0 and 3.0 features even-aged management and exclusive use of uneven-aged management would not meet the purpose and need of the project.
7. **Manage for Forest Interior Species and Fragmentation Reduction:** A specific alternative to address primarily forest interior species and fragmentation reduction would not fully address the purpose and needs for this project and would not meet Forest Plan direction or MA 1.0 and 3.0 goals and objectives. Forest connectivity will be analyzed in the environmental assessment. Implementation of the no action alternative could possibly result in fragmentation reduction over time depending on the occurrence and extent of future natural disturbances within the BCPA.

2.3 Comparison of Alternatives – Actions and Outputs

Table 8. Comparison of Alternatives to the DFC and Present Condition of National Forest Land in MA 1.0 within the Project Area

Desired Future Condition			Present Condition	In 10 years – 2016		
				Alt. 1	Alt. 3	Alt. 4
Vegetative Management						
Age-class distribution	0-10 (seedlings)[1]	20%	0%	0%	8%	8%
	11-20 (sapling)[1]	20%	9%	0%	0%	0%
	111+ (old growth)	-	0%	<1%	<1%	<1%
Wildlife						
Permanent openings	Up to 3%		7%	7%	7%	7%
Conifer[2] component	Minimum 2-5%		6%	6%	6%	6%

1. The Forest Plan specifies a minimum of 20 percent in the 0-9 age class and 20 percent in the 10-19 age class for MA 1.0. Age class 0-10 and 11-20 are used for consistency.
2. The percentage reflects stands that are typed as conifer. A stand must contain a conifer component of >50 percent to be typed as conifer. However, this percentage does not reflect the conifer component across the project area in MA 1.0. See Chapter 3, wildlife section, for a description of available conifer.

Table 9. Comparison of Alternatives to the DFC and Present Condition of National Forest Land in MA 3.0 within the Project Area

Desired Future Condition			Present Condition	In 10 years – 2016		
				Alt. 1	Alt. 3	Alt. 4
Vegetative Management						
Age Class Distribution	0-10 (seedling)	9%[1]	0%	0%	9%	2%
	11-20 (sapling)	9%[1]	6%	0%	0%	0%
	21-50 (pole timber)	-[2]	3%	8%	8%	8%
	51-110 (saw timber)	-[2]	87%	85%	77%	83%
	111+ (old growth)	Min 5%	<1%	4%	3%	4%
Wildlife						
0-20 year age class	Not greater than 20-25%		6%	0%	9%	2%
Mast-producing timber (>35 yrs. Old)	50% or more		89%	90%	81%	88%
Permanent openings	3-10%		3%	3%	3%	3%
Conifer component[3]	No more than 10%		6%	6%	6%	6%

1. The Forest Plan does not directly state the DFC for 0-10 or 11-20 age classes as a percent of any given land area. Seedling and sapling percentages given under the DFC are derived from estimated amounts of final harvests planned over the first decade of Forest Plan implementation (forest-wide).
2. The Forest Plan does not specify distribution amounts for these age classes in this MA
3. The percentage reflects stands that are actually typed as conifer. A stand must contain a conifer component of >50 percent to be typed as conifer. However, this percentage does not reflect the conifer component across the project area in this MA as a whole. See chapter 3, wildlife section, for a description of available conifer.

Table 10. Comparison of Alternatives to the DFC and Present Condition of National Forest Land in MA 6.1 within the Project Area

Desired Future Condition			Present Condition	In 10 years – 2016		
				Alt. 1	Alt. 3	Alt. 4
Vegetative Management						
Age class	111+ (old growth)	Minimum 10%	0%	<1%	<1%	<1%
Wildlife						
Poletimber and sawtimber (>20 yrs old)	Minimum of 70%		77%	80%	80%	80%
Permanent openings	5-10%		20%	20%	20%	20%
Conifer component[1]	Generally no more than 20% in conifer cover		8%	8%	8%	8%

1. The percentage reflects stands that are actually typed as conifer. A stand must contain a conifer component of >50 percent to be typed as conifer. However, this percentage does not reflect the conifer component across the project area in MA 6.1. See chapter 3, wildlife section, for a description of available conifer.

Table 11. Comparison of Actions and Outcomes by Alternative

Proposed Activities	Alt 1	Alt 3	Alt 4
Timber Harvest			
Even-Aged Harvests (total acres)	**0**	**1239**	**666**
Overstory Removal **(acres)**	0	15	0
Shelterwood Seed/Shelterwood Removal **(acres)**	0	687	309
Thinning **(acres)**	0	537	357
Salvage Harvests (total acres)	**0**	**2**	**2**
Salvage Only **(acres)**	0	2	2
Uneven-Aged Harvests (total acres)	**0**	**0**	**54**
Group Tree Selection **(acres)**	0	0	54
Volume			
MMBF	**0**	**9.0**	**5.0**
Reforestation Activities			
Herbicide **(acres)**	0	960	574
Site Preparation **(acres)**	0	735	365
Fencing **(acres)**	0	665	358
Planting **(acres)**	0	350	231
Tree Shelters **(acres)**	0	84	73
Fertilization **(acres)**	0	244	144
Release **(acres)**	0	922	537
Restore/Improve Wildlife Habitat			
Prescribe Burn **(acres)**	0	149	149
Regenerate Aspen **(acres)**	0	51	51
Plant Shrubs/Aspen/Conifers[1] **(acres)**	0	99	99
Establish Warm Season Grasses **(acres)**	0	5	5
Prune/Release Fruit Trees **(acres)**	0	83	83
Fencing/Tree Shelters **(acres)**	0	89	89
Enhance Savannah[2] **(acres)**	0	18	18
Place Nest Boxes **(structures)**	0	33	33
Restore/Improve Stream Habitat			
Place Coarse Woody Debris in Streams **(miles)**	0	8	8
Plant Streamside Vegetation **(acres)**	0	9	9
Restore Wetland **(acres)**	0	2	2
Recreation Activities			
Construct additional parking areas along the Loleta and Lamonaville roads **(number of sites)**	0	7	7
Transportation Activities			
Road Construction – New Corridor **(miles)**	0	4.5	0
Road Construction – Existing Corridor **(miles)**	0	1.5	1.5
Road Maintenance **(miles)**	0	17.3	17.3
Decommission Roads **(miles)**	0	3.0	3.0
Limestone Surfacing **(miles)**	0	0.5	0.5
Pit Expansion Areas **(number/acres)**	0	6/6	4/4
New Pit Development **(number/acres)**	0	2/4	1/2

Other Indicator Measures			
Final Harvests near Yeaney Development	0	44	0
Road Density (miles of road per square mile)			
MA 1.0 – Forest Plan Standard 1 to 3	1.5	1.8	1.8
MA 3.0 – Forest Plan Standards 2 to 4	1.3	1.5	1.1
MA 6.1 – Forest Plan Standard 1 to 3	0.8	0.8	0.8
Road Management Changes (BCRAP) (Forest Service Roads) (percent)			
Open (Forest Plan Standard – 20 percent)	16	13	16
Restricted (Forest Plan Standard – (20 percent)	37	34	37
Closed (Forest Plan Standard – 60 percent)	47	53	46
Fragmentation			
Early Successional Habitat - 0-10 years old **(acres)**	0	753	360
Late Successional Habitat – 111+ years old[1] **(acres)**	302/2109	257/1751	302/1982
Core Habitat (Unfragmented Forest) **(acres)**	1148	807	1093
Unroaded Areas >500 Acres in Size (acres)			
16 McCray Run	1261	965	1261
25 Lick Run	1098	667	1098
55 WB Millstone	601	506	601

[1.] Late successional habitat is shown for the years 2016 and 2026. Acreage for 2016 includes timber harvesting proposed for the BCP. Acreage for 2026 does not include any future timber harvesting that may occur in stands that would become 111+ years old in the second decade (2017-2026).

2.4 Comparison of Alternatives – Narrative Summary

Alternative 1: No Action

None of the proposed activities (other than road maintenance) would be completed at this time. Age class distribution within the BCPA would remain the essentially the same in the short term. Natural processes would control the development of vegetation. Routine and custodial maintenance activities would occur within the project area. Road maintenance (deferred) may take place as funding becomes available.

Alternative 3: 2006 Proposed Action

This alternative would best contribute to the stated purpose and need for action by completing regeneration sequences in stands proposed for treatment. This would create 753 acres of early-successional habitat over the next decade. This alternative would enhance horizontal and vertical diversity throughout the project area through proposed harvesting, associated reforestation treatments, and wildlife habitat improvements. Reforestation treatments would control competing vegetation long enough to allow tree seedlings to become established, improving the diversity of the understory. It would also provide high quality hardwood timber through even-aged management, thus providing wood to meet people's demand for wood products and contributing to the economic vitality of local communities. Approximately 9 MMBF of timber would be harvested. The expansion of 6 existing pits and developing 2 new pits and road maintenance activities on approximately 17 miles of road would occur.

As stands mature, late-successional habitat would increase to 257 acres (about 2.5 percent) within the next ten years and to over 17 percent of the BCPA within 20 years depending on timber harvests in future projects. Core habitat would be reduced by about 30 percent due to proposed road construction and timber harvests.

Alternative 4

By reducing timber harvests and no new road construction (except for existing corridors), this alternative would have less fragmentation within the BCPA compare to Alternative 3. Overall timber harvests and reforestation treatments would be reduced by approximately 40 percent (519 acres), responding to the purpose and need to a lesser degree than Alternative 3. Approximately 54 acres of uneven-aged harvests would be implemented instead of even-aged harvests. Approximately 360 acres of early-successional habitat would be created over the next decade. Reforestation treatments would control competing vegetation long enough to allow tree seedlings to become established, improving the diversity of the understory, but to a lesser degree than in Alternative 2. This alternative would provide high quality hardwood timber but at a lesser degree than Alternative 3 with about 5 MMBF of timber being harvested. With no new road construction, less stone would be needed and therefore, less pit expansion and development would occur than in Alternative 3. No final harvests would occur near the Yeaney Development. Wildlife habitat improvements and recreation proposals are the same as those in Alternative 3.

As stands mature, late-successional habitat would increase to 302 acres (about 3 percent) within the next ten years and to about 20 percent of the BCPA within 20 years depending on timber harvests in future projects. Core habitat would be reduced by about 5 percent due to proposed timber harvests.

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Chapter 3: Affected Environment

This chapter provides a description of the BCPA and vicinity. The descriptions and analyses are based on the best available information about the affected environment. The resources described include:

- The physical environment, including the soil resources; water resources; transportation; air quality; and oil, gas and minerals.
- The biological environment, including vegetation, NNIS. and wildlife
- The social environment, including cultural and historic resources (heritage), scenery, recreation, economics, and human health and safety.

3.1 Physical Environment

This section describes the physical characteristics of the soil; water resources; transportation; air quality; and oil, gas, and mineral resources. While this section is focused on physical resources, it includes a discussion of stream-side (riparian) habitat and fishery resources.

3.1.1 Soil Resources

Soil Nutrients

The soils in the BCPA are formed from parent materials of sandstone, shale, siltstone, conglomerate, mudstone and small quantities of coal and limestone (Berg and others 1980; Bureau of Topographic and Geologic Survey, Map 7, 2000). Soils in the ANF are typically lacking in base cations, especially calcium (Ca) and magnesium (Mg), due to the rarity of limestone and dolomite in the area. Acid deposition is prevalent on the ANF, and since soils across the ANF have a low buffering capacity, they are prone to becoming even more acidic. This process further reduces levels of base cations in forest soils on the unglaciated plateau and shoulder slopes (Bailey and others 2004). Soil acidification occurs when negatively charged sulfate and nitrate ions attach to positively charged Ca and Mg ions "pulling" them off the soil particles, which permits them to be leached through the soil profile over time.

There often are high concentrations of base cations found at lower slope positions, often near seeps (Bailey and others 2004). This suggests that groundwater movement and the translocation of base cations are important processes, especially for the health of species with high base cation requirements such as sugar maple, basswood and ash trees. In summary, incoming nitrate and sulfate ions accelerate the release of calcium and magnesium, but it is not known whether these ions actually are lost from the site. Some portion is recaptured in the aggrading biomass on the site, but the relative amount is presently unknown. Recent research on ANF sites suggests that on some sites a substantial portion of the base cations may be recaptured; on other sites, significant amounts of base cations may be lost to leaching (Bailey and others 2005). The presence of a fragipan appears to play an important role in the potential loss of calcium and magnesium; fragipans limit root presence below the fragipan resulting in larger losses of base cations than on sites without a fragipan (Bailey and others 2005; Bailey and others, personal communication).

On average, about half of the nutrients stored in a tree are contained in the tops (Powers and others 1990). This means that following harvest about half of the nutrients in trees would be left on site to be recycled. Where only the stem wood is removed, as is standard practice on the ANF,

nutrient losses tend to be low. Nutrient losses from stem only removal are often compensated for by natural inputs of nutrients, resulting in no net loss of long-term productivity potential (Grier and others 1989, p. 28). Nonetheless, even whole-tree harvesting has not been shown to cause depletion of exchangeable bases in experimental work at Hubbard Brook Experimental Forest in New Hampshire (Johnson and others 1997) and at the Walker Branch Watershed in Tennessee (Johnson and Todd 1998). Nor was there depletion of soil bases following sawlog harvests at the Coweeta Hydrologic Laboratory in North Carolina (Knoepp and Swank 1997). Treetops that remain after stem removal can act as nutrient sinks, releasing nutrients slowly over time. The influences of vegetation management on base cation dynamics on the Allegheny Plateau are, as yet, not fully understood, but scientific research is ongoing and previous research (cited above) indicates that additional base cation depletion did not occur following site changes from timber harvest even more dramatic than those proposed in the BCP (Johnson and others 1997; Johnson and Todd 1998).

Application of fertilizers is planned as a part of this project. In some stands, fertilization is proposed as a reforestation treatment under Alternatives 3 and 4. Following fertilization, where the majority of the large overstory trees have been harvested, nitrogen-demanding regeneration of species (pin cherry, black cherry, raspberries, and blackberries) with shallow roots are positioned to take up excess nitrogen with minimal losses off-site (Marks 1974, pp. 83-84). Rapid uptake by these plants limits the actual increase of nitrogen and associated nutrients in the soil, preventing leaching loss. This uptake and utilization of nitrogen indicates that the palnts on site can consume the added nitrogen in fertilizer, indicating that soils of the ANF are not saturated with nitrogen (Peterjohn and others 1996). Concerns have been raised recently over base cation depletion, which can occur when soils are acidified following the application of nitrate-nitrogen fertilizer. The chemical interactions between soil and fertilizer, and especially nitrogen containing fertilizer, are complex, highly variable, and greatly dependent upon soil physical characteristics, bacterial activity in the soil, and plant uptake of the nutrients contained in the fertilizer (Brady and Weil 1996). The planned use of non-nitrate containing nitrogen fertilizers for this project may very well help reduce the level of soil acidification that occurs. Furthermore, the acreage proposed for nitrate-nitrogen fertilization on the plateau and shoulder landform positions (where base cation loss is a greater concern) has been reduced in the BCPA. Due to existing site conditions within the BCPA, fertilization, where prescribed, could help facilitate the establishment of regeneration on some of the more difficult sites.

Herbicide, another site preparation technique, is used to remove vegetation that interferes with the regeneration process. Use of herbicide increases the levels of light and soil resources available to regenerating vegetation. The typical half-life of glyphosate herbicide in soils on the ANF is 4 to 6 weeks (USDA-FS 1986b, p. 4-125). Glyphosate herbicide binds readily to soils and becomes relatively immobile, so there is limited potential for residual effects or effects to soil nutrients. Sulfometuron methyl herbicide is also strongly absorbed to soil particles at low pH (acidic conditions) and at high organic matter contents; therefore, little soil mobility is expected. Nonetheless, it can have some residual effect on soil nutrients and is listed as “inhibitory” for some soil fungi and bacteria. Schreffler and Sharpe (2003) indicate that sulfometuron methyl applied after timber harvest acidifies soil, but the results were not statistically significant. While soil acidification is a concern, no other studies have indicated that sulfometuron methyl has the side effect of soil acidification. Sulfometuron methyl is broken down by water and microorganisms. It can breakdown in a few days to several weeks depending on soil and air temperatures, but based on average soil conditions found on the ANF, the half life is expected to

be less than 3 weeks. Principal products of the breakdown of sulfometuron methyl include saccharin, carbon dioxide, and methyl 2-(aminosulfonyl) benzoate.

Carbon sequestration, which refers to the "storage" of carbon in organic compounds, has become an area of interest due to increasing concerns about the role that atmospheric carbon dioxide plays in global warming. Carbon that is stored in the main stem harvested for timber can remain stable for centuries in a wood product created from the timber. The parts of the main stem not turned into a long-term wood product likely would either be decomposed or burned, both of which would release the carbon back to the atmosphere. Branches and roots left in the stand decompose over time, releasing carbon into the soil or the atmosphere. Carbon stored in the soil is extremely stable and is only affected if the soils are highly disturbed (Johnson 1992, Strong 1997).

Carbon storage over both the short and long term could be quite different among the management alternatives. The most useful comparison employs the concept of average annual yield. While an old forest would, at some point, contain more carbon than a young forest, the rate of carbon storage either would be very low. While trees take carbon dioxide from the atmosphere during photosynthesis, they also release it through the process of respiration. As trees age, their net carbon storage rate decreases as respiration equals or exceeds photosynthesis. As the rate of carbon storage in the trees decreases, the rate of sequestration in soils increases retaining a net positive storage rate. Over the long-term, while actually containing less carbon at some point, younger, rapidly growing forests are removing carbon from the atmosphere and storing it at a faster rate than older forests. In general, a mixture of older trees with high current carbon storage and younger trees with rapid carbon accumulation rates provide the best opportunities for carbon storage in trees (Hoover and others 2000).

While fallen branches and slash left after timber harvest are very useful for recycling nutrients and organic matter back to the soil, the main stems of dead trees that have fallen to the ground decompose much slower and provide these benefits for a much longer time (Maser and Trappe 1984). Downed trees and tops are known as down woody debris and exist in all life stages of a forest, but are usually more prevalent in older mature stands. Down woody debris also provides habitat for many species of fungi, bacteria, insects, and animals that in turn provide nutrients, organic matter, and other benefits to the soil (Maser and Trappe 1984). Down woody debris on the ANF is greatest in stands greater than 110 years of age and stands between 11 and 50 years of age (Morin and others 2001).

Surface Erosion

Erosion of topsoil can have broad and long lasting effects on soil quality. Erosion is a natural process (Dunne and Leopold 1978, p 510) but some types of land management can either accelerate the rate or change the type of erosion. Removing trees can open up the forest floor to more direct rainsplash impact and increase decomposition of litter. To this end, removal of forest litter, which increases the impact of rainsplash on bare soil, could make soil easier to erode. Changes in drainage and surface hydrology may increase water flow over an area that can cause accelerated erosion and gully formation. The changes in cover and subsequent erosion potentials are modeled using the Forest Service Disturbed Water Erosion Prediction Project (WEPP) Interface (Hall version 2004.02.18).

Soil mass movement is rare on the ANF, typically occurring after large rain events and land management activities (Eschner and Patric 1982; Pomeroy 1981, 1986; Schultz 1999). The

primary areas of concern for future soil mass movement are on historic landslides and colluvial soils formed on a surface geology of shale. In the former situation, historic or newly created landslides may require considerable investment to either revegetate or manage as a resource; while in the latter case, the instability of the contact zone between colluvial soil and shale may predispose the area to a slide. Some vegetation treatments may possibly have a compounding effect on slop stability through tree removal and the resultant decomposition of large holding roots over time. Two landslides are known to have occurred within the southern protion of the BCPA. A portion of stand 59 in compartment 662 on the north side of FR 166C is overlain by a well vegetated landslide feature. A second landslide, near the bend of FR 166C is within a few hundred feet of stand 59, but does not overlay the stand.

Road construction (following both new and existing corridors) has the potential for soil erosion and sedimentation. The largest sediment losses can occur during road building before exposed soils are protected by revegetation, surfacing, or erosion control materials. Raw ditchlines and roadbeds continue to be sources of sediment, usually because of either a lack of maintenance, a level of maintenance inadequate for the amount of road use, excessive ditchline disturbance or poorly timed maintenance relative to storm patterns. Improved design, construction, and maintenance of roads can reduce road-related surface erosion at the scale of individual road segments. Key construction and design factors, which result in reduced rates of erosion, are: road location, particularly layout relative to stream systems, road drainage, surfacing, and cutslope and fillslope treatments. Furthermore, surfacing materials and vegetation measures can be used to reduce the yield of fine sediment from road surfaces (Gucinski and others 2000).

Road maintenance can cause short-term increases in erosion and sedimentation, but it would typically reduce erosion over the long-term. Road maintenance can include: grading, surfacing or resurfacing with gravel, improving road drainage, and stabilizing back and fill slopes. Grading, while bringing up highly erodible fine soil material, can remove ruts, which if left, would create long flow paths for carrying water that could erode and transport sediment for long distances (Elliot 2000). Grading can also pull sediment out of drainage ditches along with any vegetation or armoring, and incorporate these materials back into the roadbed. Removing the ditch vegetation and armoring can cause a short-term increase in erosion from the ditch itself (Swift 1984, 1988) and erosion of the material pulled from the ditch and reapplied to the roadbed. Improved road drainage would help to avoid concentrated water flows, which could create gullies on steep slopes (Weaver and others 1995; Wemple and others 1996), while allowing water to flow in proper locations to avoid increasing the hazard of mass wasting. Improved or enhanced road drainage can also help to deposit sediment-laden runoff onto low gradient, well-vegetated areas where sediment can settle out before reaching nearby streams.

Limestone surfacing is good at reducing roadbed erosion from rain impact and heavy vehicle traffic. Generally, the addition of limestone increases the porosity and hydraulic conductivity of the road, which decreases the runoff and associated erosion (Flerchinger and Watts 1987). Limestone also reduces the formation of ruts and reduces formation of a water flow path within the roadbed (Foltz and Truebe 1995). Overall, properly sized and applied limestone has been shown to result in reductions in erosion of 79 to 97 percent over unprotected, unsurfaced roadbeds (Swift 1984; Burroughs and others 1985; Kochenderfer and Helvey 1987).

Road decommissioning refers to the destruction of an existing road surface and the underlying prism, along with one or more of the following operations: recontouring, culvert removal, mulching and establishment of a vegetative cover, and the installation of water bars (or other

water control devices). Road decommissioning is an attempt to recontour and restore the road corridor to a condition similar to what existed on site prior to construction of the road. Care is taken during the decommissioning process to ensure the final result is a stable surface, where the potential for erosion and sedimentation is minimal over the long term. Decommissioning could cause short-term increases in the rates of erosion and sedimentation to rise, but these rates would be expected to return to near base levels for the area once the decommissioned road corridor was fully revegetated. Also, it would be reasonable to expect that a fully revegetated, decommissioned road, when compared to a functioning road, would be less erosive and contribute less sediment to the watershed in which it lies (Gucinski and others 2000; Hiemenz, personal communication).

Soil Compaction

Ground-based timber harvest or salvage that utilizes heavy equipment can cause compaction. This compaction can be detrimental, depending on the weight, surface area to which that weight is applied, number of passes, soil texture, soil moisture, and rock content of the soil (Alexander and Poff 1985; Liechty and others 2002). Soil texture on the ANF ranges from silt loams to sandy loams, which are relatively to somewhat susceptible to compaction, respectively (Brady and Weil 2002). However, some soils contain a high rock content, which provides some protection from compaction by dispersing the weight of equipment. To remain consistent with the Forest Plan, no even-aged management activities, with the exception of crop tree release treatments, which do not utilize heavy equipment, will occur on poorly drained Group 3 soils, the soil most susceptible to compaction due to poor drainage. Soil compaction is considered detrimental when there is a 10 percent reduction in porosity, which typically equates to a 15 percent increase in bulk density of the soil (USDA-FS 2005a).

The greater the area of soils exhibiting detrimental soil compaction increases the greater the effect on runoff, infiltration and subsurface water movement (Froehlich 1975). Compacted soil loses its structure, and it is more susceptible to erosion. Vegetation treatments exhibit varying degrees of associated compaction, assuming ground based machinery is used to harvest the timber. Typically, the more timber removed and the more entries into a unit, the greater the extent of detrimental soil compaction. Though only one pass over a given area is usually taken, heavy equipment used to apply herbicides can also have minor, cumulative impacts on soil compaction. Fencing of a stand creates an approximately 10 foot wide disturbed area that would likely have moderate levels of compaction. The extent and amount of compaction also depends on factors such as whether the soil is frozen or the amount of slash lying on the skid trail.

From soil quality monitoring conducted during the period 1990 to 2000, specialists determined that 10 stands out of 27 monitored exceeded the Forest Plan standard (USDA-FS 2002b). Soil quality monitoring examined the effects of vegetation management on seven categories of detrimental soil disturbance, where the most applicable categories to the ANF are compaction (measured as a 15 percent increase in bulk density), rutting, puddling, displacement, and accelerated erosion. Results of the monitoring led to the creation and implementation of interim soil guidelines (USDA-FS 2001a) to help limit the categories of detrimental soil disturbance to less than 15 percent of a stand's area.

Monitoring from 2002 to early 2005 included 63 stands with 642 transects where data were recorded. There were 36 stands with less than 5 percent detrimental disturbance, an additional 14 stands with less than 10 percent disturbance, an additional 8 stands with less than 15 percent

disturbance, and only 5 stands that exceeded the 15 percent area standard (USDA-FS 1986a, p 4-21; USDA-FS 2005b).

Exceeding the 15 percent standard for these 5 stands during the 2002-2005 period highlighted the need to address soil moisture at the time of harvest (at least 3 of the 5 stands were harvested during months where precipitation was double the monthly average. Assessment of soil moisture prior to and periodically throughout the harvest can help to ensure that soil moisture in not at a point where soils are susceptible to compaction. Previously, the ANF relied on soil drainage group data, which was determined during project planning, to set the time of year for both the type of activity and equipment allowed.

3.1.2 Water Resources and Riparian Areas

This section describes the water resources of the BCPA. Watersheds provide the framework for analysis of potential cumulative effects from implementing the BCP. This section enumerates and describes water resources of the Brush Creek Project area and enumerates by cumulative effects (CE) areas the conditions of vegetation that would affect potential water flow.

WATER RESOURCES

The analysis area, which includes the BCPA plus transportation proposals outside the project area, is located in six 6th field sub-watersheds, within three 5th field watersheds; all within two 4th field sub-basins (see Table 12).

Table 12. Watershed Hierarchy for the Brush Creek analysis area

4th Field Subbasin	5th Field Watershed	6th Field Subwatershed	Major Streams w/in Project Boundary
Clarion River	Clarion River	East Branch Millstone Creek	East Branch Millstone Creek
			Laurel Run
		Millstone Creek	Millstone Creek
		West Branch Millstone Creek	Brush Creek
			West Branch Millstone Creek
	Spring Creek	Spring Creek (lower)	
		Spring Creek (upper)	
Middle Allegheny and Tionesta	Tionesta Creek	Salmon Creek	

Protected Water Uses and Criteria Necessary to Protect Each Use

Protected water uses were designated by the Pennsylvania Department of Environmental Protection (DEP) for all Commonwealth waters. All of the streams within the BCPA are classified as High Quality – Cold Water Fisheries and therefore should be managed in a way that maintains and/or propagates fish species as well as flora and fauna, which are indigenous to a cold-water habitat.

The headwaters of West Branch Millstone Creek are listed on the 2006 303(d) list of water quality limited streams for metals, pH, and siltation due to "Natural Sources" by the DEP (PA DEP 2006). The headwaters of East Branch Millstone Creek are also listed for pH due to

"Natural Sources". The impaired sections of these streams are outside of the BCPA. In addition, the sections are located upstream, so activities proposed in this project would not impact the impaired reaches. Water chemistry in the area is predicted to be marginal due to acidic bedrock and soils with low buffering capacity, in combination with acid deposition, which specifically affects mineral content and causes the water to be more acidic by lowering the water's acid neutralizing capacity. During snow melt or large rain events, episodic acidification can exacerbate pH, acid neutralizing capacity, and alkalinity and release high levels of aluminum by causing a pulse of acids and/or dilution of base cations. Research on streams in central and southwestern Pennsylvania have shown severe and chronic episodic acidification causing fish mortality and affecting fish distribution (Baker and others 1996).

The U.S. Environmental Protection Agency (EPA) regulations require an antidegradation policy as a component of water quality standards; existing water uses and level of water quality necessary to protect the existing uses, shall be maintained and protected. The Commonwealth of Pennsylvania (PA DEP 2001) has developed water quality criteria for cold-water fishes that should be applied to all of the streams within the analysis area to maintain protected uses. General water quality criteria state that, 'Water may not contain substances attributable to point or a non-point source discharge in concentrations or amounts sufficient to be inimical or harmful to the water uses to be protected…' The most sensitive protected use in the analysis area is that of aquatic life, specifically cold-water fisheries. Water quality criteria specific to cold-water fisheries includes; water temperatures that shall not exceed the summer daily average temperature of 19 ºC (66 ºF) and dissolved oxygen concentrations that shall not fall below a minimum daily average of 6.0 mg/l; an instantaneous minimum of 5.0 mg/l, and a minimum of 7.0 mg/l for high-quality cold-water fisheries. However, the aforementioned water temperature criteria applies to receiving water bodies affected by heated point sources, and would not apply to natural forested environments.

The Forest Plan (USDA-FS 1986a pp 4-19 and 4-19a) identifies additional water quality criteria and presents management practices that are important for maintaining or improving protected uses. Perennial flowing streams are to: have average daily maximum stream temperatures less than or equal to 20 ºC (68 ºF) in streams supporting cold water communities; provide habitat complexity, channel stability, and pool formation in cold-water streams by managing for the recruitment of coarse woody debris (CWD); and maintain streamside trees that provide stream bank stability. Intermittent flowing streams are to: maintain trees that provide stream bank stability; manage for leaf litter input; and manage for input of woody material.

Past Management – Water History

In the early 1800's, roads and railroads were built in valley bottoms and timber was cleared from the uplands and riparian areas (Morin and others 2001), resulting in adverse effects to the water resources. There was likely a notable shift in streamflow, sediment quantity and quality, and in channel form. Streamflow discharge characteristics (or the streamflow regime) likely shifted to higher water yield and quicker response time during flood events. The streamflow regime likely rebounded back to near predisturbance conditions as the vegetation recovered during the following three to ten years (Hornbeck and others 1993; Hornbeck and Kochenderfer 2000). Disturbance to the water resource continued as timber matured in once cutover areas, and road construction and harvest activities picked up again. Forest defoliation has occurred over nearly 86 percent of the ANF since 1985 due to insect, disease, and drought (Morin and others 2001), and has likely had an impact on streamflow quantity and quality.

Water quality was likely degraded during the initial logging period at the beginning of the 20th century as riparian vegetation was removed and sources of sediment were created on the hill slope and in the stream channel. Increases in summer water temperatures and decreases in winter water temperatures likely resulted due to the loss of riparian vegetation and subsequent thermal cover. The increase in sediment loading and changes in the streamflow regime likely resulted in a change in channel form as channels adjusted to the change in inputs. Channels on the ANF tended to adjust more laterally than vertically (incise) because of shallow bedrock and the natural armoring of most streambeds. These channels widened and new channels were carved in the floodplain as channel flow capacity was exceeded. In-stream large wood became unstable as it decomposed over the years following the initial cutover of the analysis area at the turn of the 20th century. New large wood was not yet being incorporated into the stream channel since most of the riparian timber had been removed. Channel stability was further put at risk as structure created by large wood was lost.

Historical activities and the management of oil and gas resources have also had affects on the water resource. Effects to water resources depend on the proximity of well sites to stream channels and the location and management of the roads accessing those sites. These activities typically cause notable sources of sediment and contamination to streams where BMP are not effective or mitigation measures are not maintained.

Precipitation usually occurs evenly throughout the year and averages 46 inches (117 cm) annually. About half of the total has the potential of falling as snow or rain during the colder months of October through April. During this time period, rain-on-snow driven runoff events are common and can create some of the largest streamflow events. During the summer months, when some of the greatest monthly precipitation occurs, intense thundershowers can also generate large peak flows.

Current Watershed Conditions

The BCPA is included within the Northern Unglaciated Allegheny Plateau section of the Appalachian Plateaus Physiographic Province (USDA-FS 1994a). The area is characterized by broad, rounded uplands that are highly dissected by numerous valleys, with a dendritic pattern of surface subwatershed. Current geomorphic processes include mass wasting, fluvial erosion, and deposition from transported materials.

The climate of the area is temperate with a mean monthly maximum of 79 ºF (26 ºC) to a mean monthly minimum of 15 ºF (-9 ºC). Precipitation usually occurs evenly throughout the year and averages 46 inches (117 cm) annually. About half of the total has the potential of falling as snow or rain during the colder months of October through April. During this time period, rain-on-snow driven runoff events are common and can create some of the largest streamflow peaks during the year. During the summer months, when some of the greatest monthly precipitation occurs, intense thundershowers can also generate large peak flows.

The BCPA overlaps portions of six 6th field subwatersheds (Table 13). However, project activities will for the most part be restricted to two of them, East Branch Millstone Creek and West Branch Millstone Creek.

Table 13: Brush Creek Project Area Breakdown by Subwatershed

Subwatershed	Subwatershed area (acres)	BCPA acres in subwatershed	Percent of subwatershed in BCPA	Acres of BC activities proposed in the subwatershed
East Branch Millstone Creek	16,664	3,324	19.9%	674
Millstone Creek	2,206	193	8.8%	4
Salmon Creek	35,043	9	0.0%	0
Spring Creek (lower)	29,388	0	0.0%	0
Spring Creek (upper)	26,706	15	0.1%	1
West Branch Millstone Creek	15,440	9,139	59.2%	857

EAST BRANCH MILLSTONE CREEK SUBWATERSHED

The 16,664-acre East Branch Millstone Creek subwatershed is located within the Clarion River watershed. Approximately 98.5 percent of the subwatershed (16,412 acres) is managed by the Forest Service. There are 87.8 miles of mapped stream, 7 stone pits (18.6 acres), and 87 recorded oil and gas wells in the subwatershed. There has been no timber harvest activity on National Forest land since 2000 in this subwatershed. The road density for all jurisdictions averages 2.85 miles/square mile, with a road density of 0.64 miles/square mile within 300 feet of a mapped stream (Table 14). The subwatershed is 19.9 percent contained by the BCPA (Table 14).

Table 14: Road Density in Miles/Square Miles by Jurisdiction and Proximity to the Mapped Stream System

Drainages	All jurisdiction on all ownerships	All jurisdiction within 300' of a stream on all ownerships	Forest Service Roads on all ownership	Forest Service Roads within 300' of a stream
East Branch Millstone Creek	2.85	0.64	1.48	0.38
West Branch Millstone Creek	2.85	0.33	0.65	0.10
Average	2.85	0.49	1.07	0.24

WEST BRANCH MILLSTONE CREEK SUBWATERSHED

The 15,440-acre West Branch Millstone Creek subwatershed is located within the Clarion River watershed. Approximately 59.0 percent of the subwatershed (9,106 acres) is managed by the Forest Service. There are 78.2 miles of mapped stream, 7 stone pits (10.9 acres), and 55 recorded oil and gas wells in the subwatershed. There has been no timber harvest activity on National

Forest land since 2000 in this subwatershed. The road density for all jurisdictions averages 2.85 miles, with a road density of 0.33 mi/mi^2 within 300 feet of a mapped stream (Table 14). The subwatershed is 59.2 percent contained by the BCPA (Table 14).

Other subwatersheds: There are four other subwatersheds that are overlapped by the project area (Table 13). However, for the following reasons, no further discussion or analysis of these subwatersheds will be completed.

The BCPA overlaps less than 0.1 percent of the Salmon Creek or Spring Creek (upper) subwatersheds and there are no activities proposed in either drainage.

The BCPA overlaps less than 0.6 percent of the Spring Creek (lower) subwatershed. The only activity proposed for this drainage is a 0.56-acre wildlife treatment, which is located in an upland area more than 300 feet from any stream. As a result, the BCP should have no affect on streams in this subwatershed if standards and guidelines, mitigation measures, and design features are followed.

The BCPA overlaps less than 8.8 percent of the Millstone Creek subwatershed. The only activity proposed for this drainage is a four acre reforestation treatment, which is located in an upland area more than 300 feet from any stream. As a result, the BCP should have no affect on streams in this subwatershed if mitigation measures and design features are followed (see mitigation measures.)

Streamflow Regime

Hornbeck and others (1993), identified the following generalizations relative to water yield change: 1) Initial water yield increases can occur following forest cutting, with the magnitude being roughly proportional to the percent reduction in basal area; 2) Water yield increases can be prolonged for an undetermined length of time by controlling natural regrowth; otherwise they diminish rapidly to predisturbance levels within three to ten years; and 3) Changes in water yield also respond to changes in species composition.

Reductions in basal area that approach 25 percent were found to have measurable increases in annual water yield by Hornbeck and Kochenderfer (2000). Annual increases in water yield due to timber removal are largely a result of increases in summer low flow, primarily during the growing season (Megahan and Hornbeck 2000). It is assumed that watersheds on the ANF respond to forest disturbance in a similar manner as presented in the preceding studies from across the northeast. The average time until hydrologic recovery of a harvest is between 3 and 10 years (Hornbeck and Kochenderfer 2000), and streamflow regime recovery in central Pennsylvania takes approximately four years (Lynch and Corbett 1990).

The streamflow regime has likely been modified, by the presence of roads and other compacted areas on the landscape. These areas have the potential to affect different parts of the streamflow regime and have a longer lasting affect where hydraulic connectivity exists between road subwatershed and the stream network. Wemple and others (1996) found that road segments hydrologically connected to the channel network in Oregon increase flow routing efficiency that may be observed as increases in peak flows. The BCRAP (USDA-FS 2004a) identified several road segments as exhibiting connectivity to stream channels because of ditches that routed water directly to stream channels. Therefore, it is likely that the streamflow regime has been modified by the presence of the road network and these modifications are likely to appear as increases in

peak flow magnitude and decreases in response time. Such changes in the streamflow regime can result in channel modification where channels are susceptible to such influences.

Water Quality

The physical, chemical, and biological characteristics of water are respresentative of its ability to support protected uses. Water quality in all streams within the analysis area has been determined by the Pennsylvania DEP to meet all Commonwealth standards and all protected uses. Despite this, diminished water quality and more specifically sedimentation remains a concern in both the East Branch Millstone Creek and West Branch Millstone Creek subwatersheds.

Sediment: Fine sediment quantities within project area streambeds and banks are inherently moderate as a result of the area's sandstone bedrock. However, the area's road network may have increased the amount of fine sediment available to the stream network beyond natural levels. Where road segments are hydrologically connected to the stream network, road derived sediment may be transported into stream channels. Where the amount of sediment exceeds the stream's ability to transport it downstream, deposition is occurring in the channel, covering larger substrate and filling the interstitial spaces between rocks that are important for aquatic organism survival. Where deposition is extensive enough, the protected use of aquatic life will be impaired.

The East Branch Millstone Creek and West Branch Millstone Creek subwatersheds have been moderately developed and are now crisscrossed with various non-system roads (USDA-FS 2004a). Where the road system is hydrologically connected to streams, it may be contributing sediment to them. Much of this sediment would eventually be carried into West Branch Millstone Creek and mainstem Millstone Creek where two listed fish species can be found. Gilt darters (*Percina evides*) and Mountain Brook lamprey (*Ichthyomyzon greeleyi*) have been collected from these two streams within the BCPA. Both species are classified as threatened by the Commonwealth of Pennsylvania (PA DCNR 2006) and are included on the Regional Forester Sensitive Species list.

Stream Temperatures: When streamside vegetation that provides shade to the stream channel is removed, it allows solar radiation to enter the water and cause warming (Brown 1980). Additionally, wide, shallow stream channels provide more surface area available to capture the direct warming rays of the sun. The potential for warming of the stream increases as shading vegetation is removed. Each of the action alternatives proposes some level of timber harvest, though the proposed timber harvesting should not directly affect water temperature since harvests would not occur within the streamside zone (i.e., 50 feet from intermittent streams and 100 feet from fish bearing streams plus additional distance for slope) These standards and guidelines were found to be adequate to protect aquatic life and other Commonwealth protected water uses by protecting the channel from solar radiation (Lynch and Corbet 1990).

Nutrients: Long-term measurements of water quality chemistry have found that nutrient losses resulting from commercial logging are small and should not adversely impact water quality (Swank and others 2001). Lynch and Corbett (1990) found that concentrations of potassium, nitrate, and some macronutrients were periodically increased in streams for up to nine years following harvest. Their study also showed that soil nutrient losses were very small and considered insufficient to affect site fertility and productivity. PA Bureau of Forestry (PA BOF) BMPs were followed during this study and were found to be effective at reducing nutrient losses to streams (Lynch and Corbett 1990). Nutrient losses on the ANF could be reduced even further

because a 50 foot buffer on intermittent streams is incorporated. Standards and guidelines that will help abate nutrient concerns in streams along with mitigations and design features for vegetation management to minimize soil nutrient loss are discussed in the soil nutrients section (Hornbeck and Swank 1992).

Herbicide and Fertilizer: The use of herbicide and fertilizer to aid in reforestation is a common practice on the ANF. The potential for herbicide to enter a stream and have an affect on water quality was evaluated during the summer of 2002 over a 17 day period. Herbicide was applied within a harvested unit on the Bradford Ranger District adjacent to Root Run, a perennial stream channel (USDA-FS 2002a). Forest Plan streamside buffers were implemented between the area of application and the stream, and water samples were taken from the stream following the application of herbicide. No detectable amounts of herbicide (measured as glyphosate, aminomethylk phosphoric acid, and sulfometuron methyl) were found in the water samples collected. Although it is likely that glyphosate, once applied moves no more than a few inches off-site and binds tightly to soils, streamside buffers are important to mitigate any drift in the air that may occur during application and filter any runoff that may occur during storm runoff events. The potential for sulfometuron methyl to leach into groundwater depends on soil conditions such as organic matter content, moisture, and soil pH. Sulfometuron methyl has little potential for movement into ground water in dry, acidic soil with high organic matter content. Soils on the ANF are inherently acidic and relatively high in organic matter. It is also important to apply this herbicide during dry soil conditions to avoid increasing its mobility.

The effects of fertilization on water quality were evaluated and documented in the ANF Fiscal Year 1993 Monitoring and Evaluation Report (USDA-FS 1994b). A vegetated buffer strip (150 feet wide) was left between the treated 5-acre harvest unit and the stream. Chemical measurements were made for nitrate-nitrogen and total phosphorous. Nitrate-nitrogen levels were found to remain low over the sample period of three months and well below drinking water standards. Total phosphorous levels were also found to be low. There appeared to be no detectable change in water nitrate-nitrogen and total phosphorous levels due to the application of fertilizer on the ANF when streams are buffered from the potential effect.

Stream Channel Morphology

Existing channel morphology integrates all past and present disturbances and natural processes. It is a primary indicator of water resource effects. Channel form at any location is a function of: 1) streamflow; 2) quantity and character of the sediment moving through the location; and 3) character or composition of the materials making up the bed and banks of the channel. A change in one of these variables sets up a series of concurrent changes in the others, resulting in altered stream channel form. Stream reaches generally fall into three categories: (1) energy limited - where stream energy is less than sediment supply, in these cases channel aggradations (deposition) generally occur as the channel deposits material and a balance is reached; (2) supply limited - where stream energy is greater than sediment supply, in these cases channel erosion (degradation) is likely to occur; and (3) dynamic equilibrium – where localized adjustments resulting from (1) and (2) may occur and the system as a whole is stable.

Project area streams have likely experienced channel erosion from supply limited conditions since the turn of the 20th century. Presently, most stream channels in the analysis area are still experiencing elevated inputs of storm water runoff and sedimentation, largely from hydrologically connected road networks resulting in areas of stream bank instability. Overall, the

stream channel network is currently in a state of dynamic equilibrium without excessive levels of channel scour or sediment deposition that would further alter channel form.

Although the stream network is currently in a stable condition, it visually appears that aquatic habitat diversity is low. Aquatic habitat has been simplified due to past practices of splash damming, channelization, and the cutting of streamside trees. Splash damming removed stable large wood and boulders from the channel, allowing channel bed substrate to become mobile and pools to be lost due to absence of structure and filling. Channelization from roads and railroad grades increased flow energy by restricting access to floodplains and created supply limited conditions that led to channel scour and erosion. Logging of streamside vegetation resulted in the loss of large woody debris recruitment for years to follow. Thus, the current habitat is largely defined by a high frequency of riffle and glide features, and few pools. Since pool habitat is important for aquatic organism survival and propagation, streams within the project area may not fully meet Commonwealth designated protected water uses due to the lack of adequate aquatic habitat in the form of pools. Additionally, current levels of large wood within the stream channel are most likely below the desired condition outlined in the Forest Plan of 75 to 200 pieces of large wood per stream mile. Streamside management concerns were incorporated in the proposals for the action alternatives to help protect and improve aquatic habitat by sustaining streamside vegetation and providing down woody debris.

Wetlands

Several small inventoried wetlands occur within the project area along the East and West Branches of Millstone Creek and their tributaries. The largest of these wetlands lies in the upper reaches of the West Branch. These wetlands straddle and lie parallel to the creek channels where they occur. As in this case, wetlands on the ANF are primarily located on hydric soil map stands, such as Atkins, Cavode, Brinkerton, and Buchanan silt loams (Cerutti 1985; Churchill and Parrish 1987; Kopas 1993). While wetlands provide unique, diverse wildlife habitat and pollution filtering capabilities, they are also susceptible to detrimental disturbance by ground-based equipment.

Like wetlands, riparian areas are often prone to detrimental soil disturbance due to wet soil conditions. The riparian influence on soil properties is evident in Philo silt loam and other streamside soil series. Often, though, riparian areas will not influence enough of the soil in an area to show up on the maps. Nonetheless, riparian areas have distinct soil properties and soil drainage characteristics that make them prone to detrimental soil disturbance, which can impact streamside hydrology and sedimentation.

Springs and seeps that do not appear on topographic maps also occur in or near proposed timber harvest or reforestation stands and require one or more Forest Plan standards and guidelines or mitigation measures to protect these resources and maintain water quality. These tiny streams not only carry water during periods of elevated precipitation and snow-melt but may also function as moist corridors for indigenous species (salamander) migration and dispersal. The area surrounding the springs and seeps is also important to plant and animal distributions. Canopy cover needs to be maintained around springs and springs to maintain micro-climate and prevent conversion to grass or fern cover. Vernal pools exist in the project area and these seasonally wet areas provide habitat to a variety of amphibians and reptiles. In addition to the breeding pools, the surrounding upland forest is critical habitat that is used by pool-breeding amphibians during their life cycle. Within this habitat, it is important to maintain forest floors with suitable

conditions, such as minimal compaction and rutting, deep litter, coarse woody debris, and canopy shade (Calhoun and deMaynadier 2004).

3.1.3 Transportation

Within the BCPA, there are State, Township, Forest (federal), OGM, and other private roads that have developed over the past 100 years. Roads provide access for resource management, OGM development, and recreation activities. At the same time, roads can reduce solitude by their use, increase the potential for soil erosion and sedimentation, and increase the effects of fragmentation.

The Forest Service has completed the Brush Creek Road Analysis Process (BCRAP) (USDA-FS 2004a) that included evaluating all the roads within the BCPA for their effects on the ecosystem. There are approximately 24 miles of state and township roads, 19.8 miles of Forest Service system roads, and 18.8 miles of OGM and other private toads within the BCPA. The roads analysis required evaluation of the entire road system to determine if new road access was needed, if the existing road system was adequate in terms of safety, where improvements are needed to lessen environmental impacts, and if any roads need to be closed or restricted for resource protection.

The affected environment for transportation within the BCPA is described in terms of road density and road management. These two items serve as indicators of the consequences of implementing alternatives and reflect the changes of road construction, maintenance, and decommissioning by alternative.

The affected environment will also include a discussion of the unroaded areas identified in the Forest-Wide Roads Analysis (USDA-FS 2003) and the changes to the size and shape of those unroaded areas by alternative.

Road Density

Road density is the number of road miles per area of land. This measurement is included as an indicator of effects because the underlying assumption is that as road density increases, both the impacts of the transportation system and cost of maintaining that system increase. The Forest Plan provides a density standard for the Forest Service road system for most management areas. Table 11 (in Chapter 2) shows (1) the Forest Plan standards for road densities for forest roads and (2) the existing forest road densities by management areas within the BCPA. All of these road densities are within Forest Plan standards (USDA-FS 1986a).

Road Management

There are three basic road management strategies on the ANF: open, closed, and restricted. Open roads are forest roads that are opened year round to public motorized traffic; closed roads are forest roads that are closed year round to public motorized traffic; and restricted roads are forest roads that are open seasonally to provide public motorized use. The Forest Plan provides long-term objectives for road management for the Forest Service road system. Long-term objectives in the Forest Plan are 60 percent closed and 20 percent each for open and restricted. Table 11 (in Chapter 2) shows the breakdown for forest roads by road management objective for the existing condition within BCPA. Currently, the BCPA does not meet the long-term objectives in the Forest Plan.

Unroaded Areas

There are three "unroaded areas" exceeding 500 acres within the BCPA identified in the Forest-Wide Roads Analysis (USDA-FS 2003). Table 11 shows the unroaded areas and their current size. Unroaded areas have been defined as: areas that do not contain classified roads; areas without the presence of a classified road – and of size and configuration sufficient to protect the characteristics associated with their roadless condition; and areas distinct from and not overlapping inventoried roadless areas.

"Unroaded areas" is a term and definition that is no longer applicable. It was originally described in Interim Directive 7710-2001-1 and 7710-2001-2. The direction to address road management activities in inventoried roadless and contiguous unroaded areas was removed from the Forest Service Directive System by Amendment Number 7700-2300-2, effective December 16, 2003, which superseded both ID 7700-2001-1 and 7710-2001-2. The Forest Service Manual no longer includes Chapter 7712.16 through 7712.16d, which described "contiguous unroaded areas".

As an aside, if the Forest Service still considered management of roads within a contiguous unroaded area, FSM 7712.16, if still in use, would have required that the area be 1,000 acres or more in size. Because of public concerns expressed about the impacts of road construction and timber harvesting on the unroaded areas that were identified in the Forest-Wide Road Analysis, changes in the size of unroaded areas are being examined in this analysis.

3.1.4 Air Quality

The Clean Air Act established six principle pollutants that act as indicators of air quality in the U.S., including ozone, particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead. The National Ambient Air Quality Standards (NAAQS) were established for each of these criteria pollutants. The NAAQS are the concentrations of these principle pollutants above which adverse effects on human health may occur. Geographic areas where air pollution levels consistently stay below the NAAQS are designated "attainment" areas. Geographic areas where air pollution levels persistently exceed the NAAQS are designated "non-attainment" areas. If a geographic area was at one point in time designated as a non-attainment area but is now in attainment (with a maintenance plan approved by the Environmental Protection Agency [EPA]), it is designated as a "maintenance" area.

The project area is located in Elk and Forest Counties, Pennsylvania, which have been listed as Class II airsheds in accordance with the Clean Air Act. Class II airsheds allow moderate deterioration of air quality not to exceed the NAAQS. Elk and Forest Counties have also been designated as attainment areas by the Pennsylvania Department of Environmental Protection (PA DEP) for each of the six principle pollutants. USDA-FS management actions are required to comply with PA DEP regulations that would prevent a violation of standards for the principle pollutants.

3.1.5 Oil, Gas and Minerals

According to district records, there are currently 54 active, inactive, or plugged OGM wells located within the project area. Each well site (well pad and access road) occupies approximately 0.75 acre of land. This translates into approximately 40 acres of NFS lands within the project area being used for or used in the past for OGM production.

3.2 Biological Environment

3.2.1 Vegetation

The ANF falls within the Allegheny hardwood forest, a heavily forested region covering almost 16 million acres of the Allegheny Plateau and Appalachian Mountains across parts of Pennsylvania, New York, Maryland, West Virginia, and Ohio (Marquis 1994). Major forest types currently found in the region include Allegheny hardwoods (dominated by black cherry and maples with lesser amounts of white ash and yellow poplar), northern hardwoods (dominated by American beech, sugar maple, black birch, yellow birch, and eastern hemlock), mixed upland hardwoods (composed of mixtures of red maple, black cherry, yellow poplar, white ash, basswood, and cucumber magnolia), and oak forest types. Forested conditions occur on approximately 95 percent of the ANF; a majority (78 percent) of these stands are even-aged and greater than 60 years old (USDA-FS 2000b, p. 53). At the landscape scale, Allegheny hardwood, northern hardwood, and mixed upland hardwood types occur predominantly on plateau environments, while the oak type occurs along major river valleys, and coniferous forests (predominantly eastern hemlock) are found primarily along riparian corridors and on north-facing slopes.

A number of important factors have affected the overall structure and composition of forest resources on the ANF, including natural disturbances, historical land uses and developments, forest health issues, deer browsing, and current land use patterns. The remainder of this section discusses each of these factors as they relate to the vegetation within the project area. The current condition of vegetation resources within the project area is also discussed.

Natural Disturbance Patterns in the Allegheny Hardwood Forest Region

Damaging winds in the form of tornadoes, thunderstorms, and other windstorms are the primary natural disturbances in forests on the Allegheny Plateau (Marquis 1975). Wind regularly affects the forest canopy on a small scale by damaging tree crowns and uprooting individual or small groups of trees. In many cases, certain stands are more prone to windthrow due to terrain factors that funnel winds over a particular landscape position or soil factors (such as shallow or wet soils) that restrict tree-rooting depth. However, more intense winds may also create landscape-level disturbances by blowing down or destroying large groups or entire stands of trees. An example of this was a severe weather event that struck northwestern Pennsylvania during the late afternoon of July 21, 2003, and was followed by a second day of severe weather on July 22. Heavy rainfall and high downburst winds caused downed power lines, uprooted trees, and flash floods. The July 21 thunderstorm produced heavy rainfalls and wind gusts up to approximately 80 miles per hour. An F-1 tornado was confirmed just a few miles east of the ANF boundary. Warren, Forest, and McKean Counties were among several counties declared as Federal Disaster Areas. About two acres of the project area were affected by the July 2003 storm. Damage to this stand ranged from light (scattered toppling or snapping of single trees) to moderate (small clusters of downed trees).

During the period from 1993 to 2004, the Allegheny Plateau area, which includes the ANF, experienced 133 thunderstorms and high wind events, an average of 11 high wind events per year. According to the historical record, tornadoes are infrequent, with nineteen days of tornado activity occurring in the last 50 years. There have been a few “tornado events” in the past 20 years where several tornadoes hit on the same day; the most spectacular being on May 31, 1985,

when 12 tornadoes were recorded across the 4 counties containing the ANF (National Climate Data Center 2005). Other events such as ice storms, droughts, and seasons of above average rainfall also affect forests in the region on the landscape scale. Although ice storms may severely damage the overstory canopy by breaking branches, ice glazing also increases the susceptibility of individual trees to windthrow by heavily weighting the tops of individual trees. Factors such as drought, which weakens tree-rooting strength, and excess rainfall, which loosens soils, may also increase the overall susceptibility of stands to windthrow events.

Disease and insect infestations can weaken tree-rooting and bole strength, which also increases the overall susceptibility of trees to windthrow and wind snap events. As trees mature, they naturally become more vulnerable to insect and disease infestations. The ANF and the stands in the project area are susceptible to native defoliators, such as elm spanworm, cherry scallopshell moth, fall cankerworm, and forest tent caterpillar. They are also susceptible to exotic insects and diseases, including beech bark disease complex, pear thrips, and gypsy moth. Between 1965 and 1985, insects and diseases had a modest impact on the ANF (USDA-FS 1985a). Several substantial insect defoliations have occurred since 1985, and the average level of defoliation appears to have exceeded that which occurred between 1965 and 1985. Elm spanworm defoliation in the project area occurred in 1992, 1993, and 1994. Cherry scallopshell moth defoliation occurred within the project area in 1972, 1984, and 1995. Beech bark disease complex began appearing within the project in about 1990. Evidence of pear thrips infestation was observed in the late 70s and early 80s. In the mid-1990s, a portion of the ANF was sprayed with a biological insecticide (*Bacillus thuringiensis or Bt*) to help reduce defoliating insect damage to tree crowns and to help reduce the potential for tree mortality to develop.

Due to the nature of the predominant forest types and normally high humidity and cool climatic conditions, fire is generally not a major natural disturbance factor in the Allegheny hardwoods region. However, severe drought coupled with other disturbances such as insect infestations, disease, or windstorms can create high fuel loads and greatly increase fire risks for ANF forest types. These conditions typically occur every 200 to 300 years or longer (Ruffner and Abrams 2003). Prior to European settlement of the region, Native Americans regularly practiced burning the forest understory on portions of the ANF (particularly along major waterways), which helped maintain oak forest types and associated wildlife habitats. The most intense wildfires in the region were associated with railroad logging practices of the late 1800s and early 1900s, which created large amounts of highly flammable fuels in the form of coniferous slash and other woody debris (Marquis 1975, 1994). Often, these intense wildfires significantly retarded the natural re-growth of forest resources and resulted in conversion of many sites on poor soils to permanent openings or savannahs with sparse tree cover.

The overall effect of these natural disturbances was to maintain, to some extent, a spatially variable and complex mosaic of different forest types and stand ages. Recent research conducted on the ANF suggests that the intensity and frequency of such disturbances varied across landscape gradients (Ruffner and Abrams 2003). Compared to more protected riparian and bottomland sites, uplands and side slopes experience more frequent, intense, and larger scale disturbances (particularly from windstorms) that promoted a patchy and irregular landscape structure composed of multiple cohorts. These factors also promoted the development and persistence of stands dominated by species such as beech, black cherry, red maple, and birch on upland sites, while lower-intensity disturbance regimes favored dominance of forest communities by eastern hemlock.

Historical Influences on Forest Resources

Forests on the ANF have experienced dramatic changes over the past 200 years. Prior to European settlement of the region, mature hemlock-beech and northern hardwood communities dominated the region, with minor amounts of eastern white pine and oak (Ruffner and Abrams 2003). Systematic extraction of forest resources in the region began in the late 1850s with selective utilization of eastern hemlock bark by the tanning industry (Morin and others 2001). During the late 1800s, sawmills also used significant quantities of both hardwoods and softwoods for lumber, furniture, and paper products. Starting in the 1890s and continuing into the 1930s, the demands of these industries were supplemented by the demand of the wood chemical industry for all sizes of trees in the region producing acetic acid, charcoal, wood alcohol, and other distillation products. During this period, harvests often occurred in two phases, with a first phase removing sawtimber for solid wood products and a second cut removing virtually everything else for the chemical wood industry.

As a result of the historically intense use of forest resources, the forest resources found today on the ANF are mostly second (or, in some cases, third) growth stands that began to grow at approximately the same time as acquisition by the Forest Service in the 1930s (Morin and others 2001). Although the overall diversity of tree species in these even-aged forests remained relatively unchanged, the abundance of particular species was significantly different from conditions found prior to the previous era. Eastern hemlock, American beech, and white pine are considerably less abundant, while proportions of early successional species such as black cherry and red maple greatly increased. Sugar maple also became more abundant across the landscape, particularly on upland sites.

Analysis of past disturbances indicates that stands within the project area were historically affected by both selective harvesting of sawtimber and clearcutting for the chemical wood industry prior to establishment of the ANF. Recovery pole-size and sapling-size stands that had been re-cut by the chemical wood industry after the 1936 ice storm regenerated primarily by stump sprouts, which has resulted in stands comprised almost entirely of black cherry, sugar maple, red maple, and beech; many of the trees in these stands now contain multiple stems.

Deer Browsing

The effects of browsing by white-tailed deer have played a more pervasive and ecologically significant role in subsequent development of the forest resources on the ANF. In general, deer can impact the understory dynamics of forest stands both directly, by eliminating palatable species, and indirectly, by promoting the growth of browse-resistant or less-palatable species. Deer selectively browse desirable tree seedlings such as oaks and conifers over less palatable species such as American beech and striped maple (Marquis and Brenneman 1981; Horsley, and others 2003). Browsing impacts are a function of deer density and browse availability. In areas with high deer densities, browse impacts are high on many desirable understory herbaceous species, including native wildflowers, such as trilliums, orchids, and Solomon's seal, and shrubs, such as hobblebush (Hough 1965; Frankland and Nelson 2003; Augustine and Frelich 1998).

Deer herd densities were extremely low across the region during the early 1900s due to unregulated hunting and over-harvesting of deer. In many areas, the lack of browse pressure facilitated the initial establishment of new seedlings and forest stands following turn of the century harvesting activities. However, with subsequent protection from unregulated hunting, restocking programs, and abundant food resources created by turn of the century logging

activities, the deer population in the region recovered rapidly to the point where serious browse damage was noted to both agricultural crops and forest resources (Marquis 1975).

Although currently managed by state-regulated hunting programs, average deer herd densities in northern Pennsylvania remain well above maximum levels (about 18 deer per square mile) that permit establishment of desirable advanced regeneration of tree seedlings (Tilghman 1989; Morin and others 2001). The long-term impact from prolonged periods of high deer densities has been the loss of desirable understory and midstory vegetation across much of the ANF and the development of "park-like" conditions in many stands. Selective browse pressure has promoted dominance of the herbaceous understory and shrub layers by browse-resistant and unpalatable species such as hay-scented and New York ferns, various grasses and sedges, striped maple, and American beech root suckers. The cumulative effect of browse pressure and intense competition from undesirable vegetation has necessitated costly reforestation approaches on the ANF, such as fencing, applying herbicide, and installing tree shelters to facilitate the regeneration of diverse, desirable tree and shrub species. In many cases, the general lack of advanced regeneration in the forest understory also limits the application of uneven-aged management techniques within forests that normally have a more varied age and size structure, such as the northern hardwoods type (Barrett 1995).

Across the ANF, deer management is guided by the policies of the Pennsylvania Game Commission (PGC). Pellet group counts conducted within the project area from 1998 to 2006 suggest an average overwintering deer density of about 20 deer per square mile. Beginning in 2003, the PGC allowed landowners and land managers concerned about deer impact on forest resources to participate in a Deer Management Assistance Program (DMAP) through which landowners could distribute additional antlerless deer tags to interested hunters in order to reduce deer densities and deer impacts. The ANF participated, forest-wide, in this program from 2003 through 2005, and participation and success have been high.

Forest Health Issues Related to the ANF and Project Area

Several important forest health issues are currently affecting the forest resources of the region. During the past 15 years, a number of native and exotic disturbance agents have become a particular concern for the ANF, including pear thrips, forest tent caterpillars, gypsy moth, fall cankerworm, elm spanworm, beech bark disease complex, maple decline, and ash dieback (Morin and others 2001). Since 1985, almost 86 percent of the forest resources of the ANF have experienced at least one defoliation event due to the action of one or more of these stress agents. Severe droughts have also affected the region six times since 1988. In addition, the area is the recipient of some of the highest inputs of acid deposition (sulfates and nitrates) in the nation. Recent evidence suggests that this has led to the leaching of the nutrients (calcium and magnesium, that are important to some tree species) from forest soils while potentially toxic aluminum and manganese have become more available (Bailey and others 2005). Sugar maple has been shown to become more vulnerable to stresses like insect defoliations in soils on upper slopes and plateau tops (Long and others 1997; Horsley and others 2003) while black cherry and beech did not show responses across a wide range of these nutrients in a study just east of the ANF (Long and others 1997). Trees weakened by such stress agents are also highly susceptible to damage or bole breakage by wind (for example, "beech snap") and invasion by secondary pathogens, such as shoestring root rot fungus, that can cause tree mortality.

The cumulative effect of such forest health impacts has been the decline, and in some cases, catastrophic mortality of the forest overstory in some locations over the past decade. In addition,

the persistence of forest cover at the landscape level may be threatened in areas where deer browsing and competing vegetation have prevented development of an adequate pool of diverse advanced regeneration and young trees to replace dead trees in the forest overstory. According to recent inventory data across the ANF, the percent mortality of the total standing tree basal area is particularly heavy for species, such as sugar maple (18.2 percent), birch (11.4 percent), white oak (17.4 percent), and aspen (25.8 percent) (Morin and others 2001). Mortality of American beech trees larger than 20 inches DBH is also significant (almost 50 percent); however, beech scale (an introduced invasive insect) does infest all sizes of beech and mortality can result. Beech bark disease complex is of particular concern for the ANF because the "killing front" is advancing across the forest from the northeast to southwest and many stands contain a high percentage of American beech.

Public and Private Land Uses within the Project Area

Ninety nine percent of the project area is NFS lands. The Federal government acquired much of the ANF in the 1920s and early 1930s. There are 99 acres of private land within the project area. Based on estimates from aerial photographic interpretation, these properties are a mix of mature hardwood forest (97 acres) and a variety of openings (2 acres of agricultural fields, access roads, and residences or recreational camps). Commercial timber management has not been a high priority of these landowners.

Current Conditions of the Vegetation within the Project Area Including Midstory and Understory Vegetation

Experience from research conducted within and outside of the project area helped confirm that controlling competing vegetation and reducing the effects of deer browse are critical to successful establishment and maintenance of desirable tree and shrub species. In addition, control of competing vegetation using herbicides and fencing were often required to promote a diversity of sufficient, advanced regeneration in stands prior to or after overstory removal.

Maturing hardwood forest habitat dominates the project area. Most stands are well stocked, except for areas affected by hardwood decline and mortality. Using aerial photographs, district records, and recently collected data, it is estimated that the age classes in the project area are distributed as shown in Table 15.

Table 15. Age Class Distribution by MA and Acres

Age Class	Years of Origin	MA 1.0 Acres	MA 3.0 Acres	MA 6.1 Acres	Total Acres
1-10 years old	1997-2006	0	0	0	0
11-20 years old	1987-1996	182	369	63	614
21-30 years old	1977-1986	93	93	39	225
31-40 years old	1967-1976	26	51	27	104
41-50 years old	1957-1966	115	22	0	137
51-60 years old	1947-1956	51	84	7	142
61-70 years old	1937-1946	8	493	180	681
71-80 years old	1927-1936	486	983	413	1882
81-90 years old	1917-1926	737	2264	617	3618
91-100 years old	1907-1916	212	1396	199	1807
101-110 years old	1897-1906	313	219	36	268
111+ years old	1887-1896	0	343	0	34
Savannahs and other openings	N/A	138	215	383	736

Age classes can also be grouped by tree size class. The tree size classes in the project area would be divided up as shown in Table 16.

Table 16. Tree Size Class by Acres

Class	Acres
Seedlings (1-10 years)	0
Saplings (11-20 years)	614
Poles (21-50 years)	466
Sawtimber (51-110 years)	8,398
Large Sawtimber (111+ years)	34

It is estimated that 736 acres of the project area are considered non-forest habitat including openings, roads and railroad corridors, pipelines, utility corridors, OGM and other forest (cultural) openings. Past vegetation management (timber harvests), road construction, pipeline and utility corridor development have influenced to the current forest conditions within the project area.

While many stands are well-stocked, forest health problems, such as beech bark disease and sugar maple decline, have affected a portion of the project area. The beech scale/beech bark disease complex was first observed in the project area in 2000. Mortality of beech and sugar maple has occurred within the forest overstory in many locations within the project area.

Understories within the project area are generally dominated by interfering ferns, grass, beech, and/or striped maple. Some portions of the project area have a high proportion of black birch in the understory. The cover of native wildflowers is generally sparse (less than 10 percent), particularly in areas with heavy fern cover. No occurrences of the federally endangered small-whorled pogonia were documented during field surveys. Dense concentrations of striped maple are often found in the shrub layer, with patchy clumps of blackberries in stands with a more open overstory. During field surveys of the project stands, dense thickets of beech sprouts (root suckers and stump coppices) also were observed in many locations, particularly in stands where the overstory has declined. Advanced regeneration of desirable species, such as black cherry, red maple and yellow poplar, is lacking over much of the project area; however, advanced regeneration has been observed in some stands that had been previously fenced or received an herbicide application in the past to control competing vegetation (Stout 1994). Soils over a lot of the project area are not well-suited to seed production or regeneration of sugar maple (Horsley and others 2000, Horsley and others 2002). Deer browsing across the project area is currently moderate; however, when fences are installed, improvements in the diversity seedlings and herbaceous communities are observed, as well as increases in the height growth of seedlings.

Where present, the forest midstory typically consists of striped maple, American beech, pin (fire) cherry, sugar maple, and birch. However, the forest midstory in the project area is generally sparse (less than 30 percent) and often absent in areas with dense fern and grass cover (USDA-FS 2000b).

Currently, 34 acres of forest land within the project area is believed to be older than 110 years. Within the BCPA, 24 stands, totaling 552 acres, have been designated as old growth stands in previous NEPA documents.

3.2.2 Non-Native Invasive Species (NNIS)

Many factors may influence the ability of a particular species to become established into new areas and the extent to which a particular species becomes established. Biological, physical, and environmental barriers affect plant invasions. Of the approximately 1,200 plants species listed for the ANF, 251 are introduced species (Hays, personal communication 2002, adapted from Rhoads and Klein 1993). While many of these species may never occur in prominence, others may invade sensitive habitats. The Forest Service has compiled a list of invasive plants found in the Eastern Region and ranked them by their degree of invasiveness based on information from States in the Eastern Region.

The potential of introduction and/or spread of NNIS species depend on many factors. Disturbances may facilitate plant invasion by overcoming physical and environmental barriers (Parendes and Jones 2000, p 65). However, the level of disturbance it takes to do so varies by plant species, habitat type disturbed, and environmental conditions. In order to assess the presence and/or extent of NNIS, plant surveys were conducted in all proposed timber harvests and reforestation treatments and along road corridors in the project area and for the BCRAP. Thirteen NNIS species were recorded during field surveys of the project. These included: Japanese barberry, autumn olive, reed canary grass, common tansy, bull thistle, Canada thistle,

crown vetch, multiflora rose, Tartarian honeysuckle, morrow honeysuckle, Japanese honeysuckle, Japanese knotweed, and garlic mustard. Survey summaries and maps of documented infestations can be found in the project file.

3.2.3 Wildlife

This section includes a description of the affected wildlife resources in the BCPA and an analysis of impacts on those resources using a three-tiered approach:

- A coarse filter approach is used to identify plant and associated wildlife communities at the landscape scale. This approach assumes that if the species, genetics, functions, and processes are monitored and protected at the landscape or community level, then the bulk of the biotic species, both known and unknown would be protected. This approach will examine current conditions and the effects from changes to the conditions.
- A management indicator species (MIS) approach is used to evaluate the present condition of wildlife habitat and to assess changes in available habitats that would occur under each alternative. The results from an analysis using this approach can then be applied to a group of species with like habitat requirements.
- A fine-filter approach is used to evaluate habitats and assess effects on threatened, endangered species (TES) and Regional Forester's Sensitive Species (RFSS). At the stand level, this approach assesses effects on rare or sensitive communities that may be present such as riparian areas, wetlands, and unique or specialized habitats. The biological assessment (BA) provides further discussion related to the steps used in the wildlife analysis, as well as a detailed evaluation on the habitat and potential effects on TES species.

Coarse Filter Approach: Composition and Structure of Wildlife Habitats

The following discussions apply the coarse filter approach to the project area, cumulative effects (CE) area, and habitat fragmentation.

Project Area

At the landscape scale, the diversity of wildlife present is dependent upon the availability of habitat and the successional stages of various forest and non-forest cover types. Approximately 314 wildlife species (51 mammals, 213 birds, 24 reptiles, and 26 amphibians) are currently found across the ANF in a variety of habitat types. DeGraaf and others (1992) developed a wildlife habitat relationships model for New England. Table 17 presents the forest and non-forest community types found in New England that are closely associated with habitat relationships in the project and the number of species associated with each type. The highest levels of species richness observed on the ANF are associated with mature (51 to 110 year age class) hardwood forest communities. Hardwood communities are more abundant than coniferous forest types or communities associated with permanent openings.

Table 17. Species Richness in the BCPA

Community		Fauna (number of species)				
	Amount [1]	Amphibians	Reptiles	Birds	Mammals	Total
Hardwoods						
Seedling (0-10 years)	0%	10	9	95	42	156
Sapling (11-20 years)	6%	17	11	64	37	129
Pole (21-50 years)	5%	17	11	64	37	129
Mature (51-110 years)	81%	18	12	89	44	163
Over mature (111 + years)	0.3%	0	0	26	14	40
Conifer						
Coniferous Forest [2]	6%	12	7	74	37	130
Non-Forest						
Permanent Openings (Grass/Forbs/Shrub)	7%	2	14	69	25	110

Notes: Species-habitat relationships adapted from DeGraaf and others 1992

1. Habitat amounts are displayed for federal land in the proposed 10,248-acre project area.
2. A stand is classified as conifer when evergreen trees occupy 50 percent or more of a stand's canopy. The amount shown does not include conifer inclusions which occupy an estimated 21 percent of the project.

Figure 1 displays the forest types and age classes for the stands in the BCPA. Vegetation treatments are proposed in MAs 1.0, 3.0, and 6.1. The proposed timber harvest in MA 6.1 will be implemented to benefit wildlife species that require a late-successional forested habitat and MA 1. 0 focuses on species requiring early-successional vegetation.

In MA 3.0, a variety of silvicultural treatments are proposed to create conditions that would help establish forest cover in the commercially treated stands as well as in stands proposed for reforestation-only activities. From a wildlife perspective, it is advantageous to establish favorable forest cover in these stands so as to provide habitat for a multitude of wildlife species throughout the forest development process.

Unique plant communities, specialized habitat, sensitive ecosystems, snags (standing dead trees), and coarse woody material (down logs) are conditions that would be protected or maintained at desired levels using standards and guidelines, mitigation measures, and design features. These features are often required by species of special concern, RFSS, TES species, and species with viability concerns. An analysis of these features can be found in the fine filter approach sections. Diverse and unique plant communities are often found within riparian areas due to nutrient-rich soil, lack of recent disturbance, and elevated moisture levels. On the ANF, riparian areas, wetlands, floodplains, and unique plant communities are identified and given preferential consideration to other resources (USDA-FS 1986a, pp 4-6, 4-19 to 4-20).

Another component critical to sustaining wildlife include streams and their associated riparian zones as well as upland wetlands. The existing condition of these features and affects of alternatives are discussed under sections 3.1.1, 3.1.2, 4.1.1, and 4.1.2.

Springs and seeps that do not appear on topographic maps also occur in the project area and are protected by Forest Plan standards and guidelines, mitigation measures, and design features that protect these resources and maintain water quality. These tiny streams not only carry water

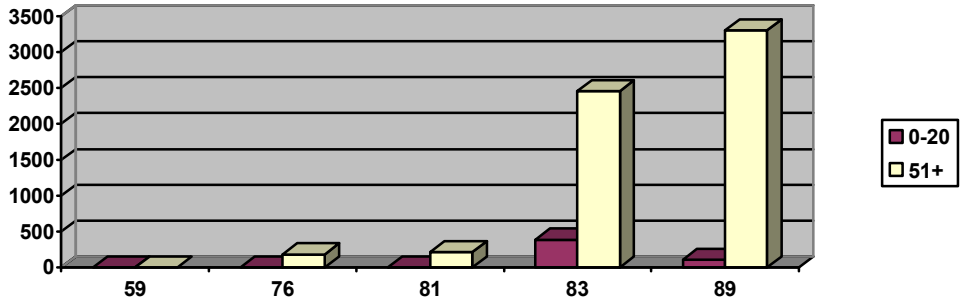
during periods of elevated precipitation and snow-melt but also function as moist corridors for indigenous species migration and dispersal, specifically salamanders.

Additional wildlife habitat features within the BCPA include rock outcrops and small surface boulders. These features are found to be widely scattered along several of the steeper slopes particularly above the larger stream corridors in the southern portion of the project area. Due to their size, aspect and slope position they offer large basking surfaces for reptiles, crevices for small mammal dens or roosts, or fissures leading underground.

Highly valued hard-mast trees (such as hickory, oak and beech), soft-mast producing shrubs, and conifer that are minor components of the forest canopy or understory would be reserved and maintained. These components would be managed as to increase their distribution in the early-successional forest conditions.

The wildlife habitat in the project consists primarily of the mature hardwood forests. Seven percent of the project area is non-forest habitat consisting of grass and shrub openings. The dominant forest community types are mixed upland hardwoods and Allegheny hardwoods composed of black cherry, red maple, beech, and sugar maple. Northern red and white oak, northern hardwoods, and red maple (wet-site) do not exist as stands within the Brush Creek Project area. (see Figure 1).

Figure 1. Acres in the Project by Forest Type and Age Class



Codes: 0-20 years (seedling/sapling age class) , 51+ years (mature forest age class)

Forest Types: 59=northern and white oak, 76=red maple (wet site), 81=northern hardwoods (sugar maple-beech-birch), 83=Allegheny hardwoods (black cherry-white ash-poplar), and 89=mixed upland hardwoods

The forest composition and structure of the project has been influenced by past timber harvesting activities. Evidence of the railroad-logging era (1900-1930) including railroad grades, cultural remains, and numerous small openings can be observed along the perennial streams in the affected watersheds. Since 1930, forest composition and structure has been affected by varying types and amounts of vegetation management. Recent declines in forest health due to drought, insect pests, and disease complexes plus windthrow from storms have altered forest stands throughout the region causing higher than normal tree mortality with numerous standing dead trees, trees with cavities available to or made by wildlife, trees with exfoliating bark, and additional coarse woody material on the forest floor.

The BCPA is dominated by Allegheny hardwoods and mixed upland hardwoods forest types with modest to dense understory vegetation consisting of American beech, black and yellow

birch, and striped maple. Stand inventory data is available in the project file. Important wildlife shrub and understory species are also present in varying amounts throughout the project area. These include mountain holly, low-bush blueberry, hophornbeam, serviceberry, leatherwood, ironwood, and witch hazel. This project area has ecosystem conditions that are particularly suited for supporting an abundance of high bush blueberries. Apple trees associated with historic use of the area, such as logging and old farms, exist in several sites across the project area (A general summary of ecosystem functions within the BCPA can be found in the wildlife report in the project file).

Nearly three dozen common herbaceous plants find suitable habitat in the BCPA. Survey data indicate that hay-scented fern, Canada mayflower, New York fern, and wood fern are the dominant ground covers in the forest interior. In addition, field surveys found at least 35 uncommon herbaceous plants such as; moccasin flower, closed gentian, and bladder campion.

Conifer stands occur on approximately six percent of the BCPA. The conifer component within the BCPA includes conifer stands and inclusions of eastern hemlock, red pine, or white pine. Geographic information system (GIS) data and ortho-photos shows five relatively large areas of dense overstory conifer intermingled with dense midstory conifer. Understory hemlock inclusions are more difficult to detect using GIS data or ortho-photos but have been documented through stand exams and are known to exist within the project area. GIS data indicates that conifer occurs as inclusions on 2,124 acres of the BCPA. Estimates indicate that approximately 1,629 acres occurs as dense overstory and 28 acres as dense midstory while the remainder is sparse and scattered. The conifer component is well represented and evenly distributed in the southern portion of the project area, including areas outside of the project boundary, and again across the northern portion of the project area. There is an obvious lack of conifer in the central one-third of the project area.

Seven percent of the BCPA is classified as opening habitat. While some of these openings were created or enhanced through forest service management, some exist as grassy roads, pipelines, utility corridors, oil or gas lease developments, log landings, and shrub openings. In addition, there is 2,061 acres of MA 1.0, which is managed to provide habitat for species requiring early-successional vegetation and associated openings.

The project has provided nesting habitat for large avian species in the past. Since 1991, a total of eight raptor nest have been documented in the analysis area. From 1993 to 1998, active red-shouldered hawk and broad-winged hawk nests were discovered and monitored. From 1998 to the present, additional nests have been found, but no activity has been documented. No active raptor or heron nests were observed during the latest field surveys. All the stick nests discovered in the BCPA have been found in the southern half of the project area. Raptors continue to use the BCPA as red-shouldered hawk, broad-winged hawk, and red-tailed hawk were heard during the most recent field surveys. All documented nests have been field checked and showed no activity. Currently, all but two of the known nests are either gone or in disrepair and unusable.

During the past nine years, white-tailed deer populations have been monitored on two transects within the BCPA. These monitoring efforts were located north and south within the project boundary and were evenly spaced among the proposed treatment stands. Based on ten samples local populations average 20 deer per square mile in or near the project.

Habitat Fragmentation

Habitat fragmentation is generally a process of subdividing a continuous area of habitat into smaller, discontinuous patches, resulting in the loss of original habitat, a reduction in patch size, and spatial isolation of residual areas of habitat. In forested landscapes, habitat fragmentation occurs at several different spatial scales, including direct losses in the amount of continuous forest cover, isolation of habitat types within a forest matrix, and edge effects that reduce the quality of fragmented habitats for plant and animal species (Lindenmayer and Franklin 2002).

In general, the effects of habitat fragmentation can be beneficial to some wildlife and detrimental to other species. For example, habitat fragmentation can benefit species that rely on early-successional or edge habitat and can be detrimental to others that rely on larger, contiguous blocks of late-successional forested habitat, such as certain neotropical migratory songbirds. Similarly, edge effects can be highly variable at a landscape scale depending on whether the gradient between different habitat types is soft (a 20 year-old regenerating cut) or hard (an agricultural field or urban non-forested land use) next to mature interior forest. Edges can also be permeable and not pose a significant barrier to species travel and dispersal patterns or form relatively impermeable boundaries, which retard species movement and can increase mortality for some groups of wildlife (such as amphibians, reptiles, and some mammals).

Although the effects of habitat loss are often difficult to separate from habitat fragmentation, the amount of remaining unfragmented or "core" forest habitat is one measure that may be used to assess the general conditions of a forested landscape (Lindenmayer and Franklin 2002). A recent nationwide assessment of forest spatial patterns and fragmentation effects at the ecoregion scale found that the Allegheny Highland Forest Ecoregion is approximately 70 percent forested with a mean forest patch size of 90 hectares (or approximately 222 acres) (Heilman and others 2002). However, the area of core forest (the amount of remaining interior forest habitat after taking edge effects into consideration using a 90-meter buffer) was 46.5 percent of the total cover of forest area. At the broad landscape scale, this suggests that the region is moderately fragmented by roads and other non-forest land uses.

A quantitative analysis of the landscape distribution of un-fragmented and fragmented core forest habitat was done using a spatial model. The shape and spatial characteristics of the landscape were incorporated into the model and a value was assigned to the forest conditions based on a scale of 0-20. This number reflects the effect of adjacent forest conditions upon forested core areas, where lands with a score of zero have the low core values and more fragmentation and lands with a score of 20 have high core values and less fragmentation. Details of this model and core values are located in the project file. A visual analysis was also done and indicates that the BCPA area has little forested core habitat. This appears to be the result of private lands within and surrounding the project boundary, open savannahs, and MA 1.0.

Project Level Filter Approach: Management Indicator Species (MIS)

ANF MIS include 13 wildlife and three fish species, representing a variety of habitats, which is useful for monitoring trends in habitat capability across the ANF (USDA-FS 1986a). In general, the conditions for MIS provide a basis for inferring conditions for other wildlife species in the forest. MIS represent groups of wildlife associated with vegetative communities and key habitat components. Evaluating the effects of management practices on these species and their habitat provides an additional basis for ensuring the maintenance of biological diversity. Habitat

improvements for the emphasized species should be designed to meet requirements of as many indicator species as practical (USDA-FS 1986a).

Using a variety of techniques, the ANF has been monitoring MIS species and their habitat since 1986. Detailed, forest-wide information on population trends and the availability of suitable habitat can be found in the Annual Forest Monitoring and Evaluation Reports (1986 – present). Table 18 summarizes information on the habitat indicators, requirements, and population trends for each MIS.

Habitat for early-successional MIS, such as the American woodcock and ruffed grouse, is present within approximately 13 percent of the project area in permanent openings and stands 20 years old and younger. There is approximately 285 acres of aspen forest type in the project with an additional aspen component scattered throughout. Conifer cover, specifically eastern hemlock, red pine and white pine, is found along drainages and across the plateau and provides important winter cover for ruffed grouse.

Abundant habitat is present to support a viable population of white-tailed deer. Pellet transects done in 1998, 1999, 2002, 2003, 2004, 2005 and 2006 indicate 30 deer/square mile, 27 deer/square mile, 12 deer/square mile, 35 deer/square mile, 16 deer/square mile, 14 deer/square mile and 2 deer/square mile respectively.

Abundant habitat is currently found within the project area for species that require mature and late-successional deciduous forest types, such as the pileated woodpecker. Approximately 81 percent of the project is currently in stands with an age class greater than 50 years old. In addition, there is a modest distribution of snags and potential den trees present due to mortality caused by insect and disease and wet soil conditions. The snags provide ample foraging and cavity nesting habitat for the yellow-bellied sapsucker and pileated woodpecker. Mature, largely contiguous tract of forestland near riparian areas and small openings, such as near the East and West Branches of Millstone Creek, provide suitable nesting and foraging habitat for the red-shouldered hawk. Pileated woodpecker and red-shouldered hawk populations on the ANF are considered viable and stable.

The great blue heron nests are protected on the ANF. Suitable nesting and foraging habitat for the great blue heron is limited to the upland portions of the project area; however, none are known to exist. There area no known historic nest sites within the BCPA.

No timber rattlesnake dens have been found within the BCPA; however, there have been numerous documented sightings of individuals. Forested stands within the project boundary provide suitable foraging habitat for the timber rattlesnake, which prefers hardwood forest with an ample supply of coarse woody debris on the forest floor, riparian areas, and a variety of small openings. In addition to foraging habitat, the BCPA has large rock outcrops and boulders that could serve as potential den sites and basking areas for this species. Standards and guidelines, mitigation measures, and design features are proposed to maintain and protect these physical features during project implementation.

Species that require a mix of mature conifer and deciduous forest types, such as the hermit thrush, black-throated green warbler, and barred owl, have generally benefited from past management activities that have retained hemlock inclusions across the landscape and increased the density of understory vegetation through thinning of the overstory canopy. Cavity-nesters

such as barred owls have benefited from areas of core forest habitat and abundant snags in the BCPA.

Song bird surveys were conducted within the BCPA on approximately 30 miles of transects in the spring of 2002 and 2003. Hermit thrush was documented on 26 of 62 survey points. Many other species were heard during the surveys. This information is available in the project file[1].

Eastern hemlock, either as conifer stands or as inclusions in hardwood stands, occurs on approximately 20 percent of the project area or provides suitable habitat for the magnolia warbler. This species may use edge habitats associated with regenerating stands, intermediate cuts, permanent openings, oil and gas developments, and utility corridors for nesting and foraging habitat.

Habitat for species that require aspen, such as beaver, is located as small inclusions or isolated stands primarily along the floodplains and riparian zones. Much of the aspen within the BCPA is found in MA 1.0. Since aspen is a featured species within MA 1.0, proposed activities will strive to retain an aspen component where feasible. Beaver activity has been documented to occur within all three sections of MA 1.0 in the BCPA.

Brush Creek, Dry Run, East Branch Millstone Creek, Laurel Run, Lick Run, Log Run, McCray Run, Scott Run, Shippen Run, Steck Run, West Branch Millstone Creek and Winlack Run are designated by the State as high quality cold water fisheries. The occurrence of brook trout is an indicator of good water quality in cold-water streams. Seasonal variations in stream flow typically affect the abundance and distribution of brook trout, and reduce their use of headwater habitat. Field observations failed to observe any brook trout within the streams in the BCPA; however, formal monitoring was not done. Suitable habitat for smallmouth bass and walleye is not present within the project area.

[1] These survey routes were randomly selected based on access. Data is not conclusive and should not be used as an indicator of population stability.

Table 18. Summary of MIS Species Habitats and Population Trends on the ANF

Species	Habitat Indicator/Habitats Used on ANF	Population Trends
American woodcock	Permanent openings, often in combination with early successional forest habitat	Monitoring data since 1990 indicate a fluctuating but relatively stable woodcock population within areas of preferred habitat. However, there has been a decline of 2.1 percent/year in the Eastern Region and 1.8 percent/year in the central region since 1968. It is widely believed that loss of old field and early-succession forest habitat is the primary cause of such decreases (Woodcock Task Force, 2005).
Ruffed grouse	Early-successional or regenerating deciduous forest habitat (usually less than 20 years old) with scattered openings and a conifer component. The aspen forest type is preferred due to the associated high stem density in regenerating stands and the food source provided by mature aspen.	The ANF has been monitoring this species since 1990. Data indicate that ruffed grouse populations on the ANF are cyclic but stable. During the last decade, the distribution and amount of available grouse habitat has increased in some areas due to development of early-successional vegetation through timber harvest, oil and gas development, and the implementation of various wildlife habitat improvement projects.
White-tailed deer	Early-successional or regenerating deciduous forest habitat found along with mature forest. Note: this species generally uses a variety of different forest, grassland, and brushy habitats.	Monitoring data indicate that the size of the deer herd fluctuates both on an annual basis and across different parts of the ANF. Average densities for the BCPA over the period 1998-2006 ranged from 2 to 35 deer per square mile (averaging 19 – under the density goal of 21 per square mile). Suitable habitat for this species appears to be of sufficient quantity and quality to provide a stable population across the ANF.
Pileated woodpecker	Old growth or late-successional deciduous forest with large diameter snags. Nesting and breeding habitat may also include stream bottoms and riparian zones with suitable large trees (Christy 1939, Hoyt 1957)	Forest-wide monitoring efforts indicate stable populations across the ANF. This is consistent with statewide information reported in Brauning (1992).
Red-shouldered hawk	Undisturbed mature upland and riparian forests. Preferred foraging habitat includes non-forested habitats and larger floodplains; may also forage over savannahs. This species may tolerate the presence of humans as long as large contiguous tracts of woods, including wetland areas, are available.	Stick nest monitoring within the BCPA shows that a red-shouldered hawk nest was active from 1993 to 1998. Red-shouldered hawks have been heard in the BCPA during the latest surveys but no active nests have been found. Although there is concern that this species is declining in Pennsylvania, the ANF contains one of the highest densities of this raptor in the state (Brauning 1992). Based upon the availability of suitable nesting and foraging habitat, forest-wide populations appear to be stable.
Great blue heron	Undisturbed old growth or late-successional deciduous forest conditions with large trees suitable for nesting. This species is highly sensitive to human disturbances and nests typically occur in isolated and remote areas. Commonly forages along streams or wetlands and	Active nesting areas have been documented at only 13 protected sites on the ANF since 1986. Additionally, many of these locations only contain one or two nests. There is a large heron rookery immediately north of the ANF, in the Quaker Run drainage in New York State and on the Allegheny River. Populations appear to be

Species	Habitat Indicator/Habitats Used on ANF	Population Trends
	are observed along Tionesta Creek in the ANF, although feeding areas are typically located far from nesting sites (Brauning 1992).	stable on the ANF. However, possibly due to encroachment from oil and gas activities into the more remote areas of the ANF, the total amount of suitable nesting habitat on the ANF may be declining.
Timber rattlesnake	Mature or regenerating deciduous forests with open ground cover containing suitable rock outcroppings for denning and basking. Often seasonally (spring/summer) found on southern exposures or near streams.	Although ANF personnel occasionally observe timber rattlesnakes foraging, basking, or traveling between winter den sites and summer habitat, observations of this species are infrequent and generally restricted to only a few areas of the ANF. There are only a few known den locations on the ANF, and many of the active den locations occur in the oak forest type along the Allegheny River. Suitable foraging, basking and den habitat is available forest wide but population and reproduction trends are unknown. Population studies are currently being conducted by the Pennsylvania Fish and Boat Condition.
Hermit thrush	Mature mixed hardwood-conifer forests. Primarily a forest interior bird, but often occupies edges and small clearings created by disturbances such as logging, drilling, or fires within forested areas. Found in a variety of forest types on the ANF, from sapling/pole stands to more mature stands.	Monitoring conducted at a number of sites across the ANF indicates that the hermit thrush is relatively common and fairly well distributed across ANF. There has been little change in the preferred habitat for this species within the project area in the last 20 years and populations and available habitat appears stable.
Black-throated Green Warbler	Mature mixed hardwood-conifer forests. This upper canopy nester prefers mature, mixed hardwood forests for nesting, and forages in both deciduous and coniferous trees in the mid to upper levels of the canopy	Breeding bird surveys and monitoring data indicate that this species is common in mature forest conditions of the ANF. Breeding bird survey data indicates that this species may be increasing statewide (Brauning 1992). Populations and available habitat appear stable.
Barred Owl	Mature mixed hardwood-conifer forests. This species requires large blocks of mature or late-successional forest and is often associated with moist sites containing a conifer component. Perennial stream bottoms and riparian areas often provide preferred nesting habitat for this species, due to the predominance of conifers and a greater number of large diameter trees.	ANF monitoring data from areas of preferred habitat actively managed for timber production indicates that barred owl populations appear to be stable and the frequency of detection of barred owls has remained constant during the analysis period (1991-1998). Barred owl populations and available habitat for this species appears stable or unchanged.
Magnolia Warbler	Coniferous forests (regenerating hemlock community). This species is an intermediate-canopy nester. This species often utilizes pure conifer and mixed hardwood-conifer forest types and the full range of successional stages (Brauning 1992). It may also be found in and also uses woodland edges and clearings adjacent to such coniferous habitats.	Breeding bird surveys and other monitoring data indicate that the magnolia warbler is common in areas of suitable habitat on the ANF. There has been little change in the preferred habitat for this species in the project area in the last 10 years and populations and available habitat are relatively unchanged and considered stable.

Species	Habitat Indicator/Habitats Used on ANF	Population Trends
Yellow-bellied sapsucker	Mature deciduous forest habitat with large cavity trees. This species may also inhabit forested pastures, orchards, forest edges, single-tree selection harvest sites, and shelterwood harvest sites (Brauning 1992).	Breeding bird and other monitoring data indicates that this species is well distributed across the ANF. Available habitat is relatively unchanged and populations are considered stable.
Beaver	Riparian habitat conditions, particularly with an associated aspen forest community.	Most of the larger perennial streams on the ANF either currently support beaver and/or have had past beaver activity. Based on the increased level of beaver activity observed across much of the ANF, forest-wide populations of this species appear to be increasing.
Brook Trout	Good water quality conditions in cold-water streams. Perennial headwater streams with moderate to steep gradients are often suitable spawning habitat.	Monitoring of brook trout has been occurring on the ANF since 1991. Brook trout populations across the ANF appear to fluctuate within a natural range of variability, and extreme high and low flows over the past few years have affected these populations. Similar results have been observed in Pennsylvania on other cold-water trout streams.
Smallmouth bass and walleye	Good water quality conditions in cool-water environments. Both species are found primarily in the Allegheny Reservoir and large river environments. Walleye is currently a demand species and stocked for recreational fisheries purposes.	Although the abundance of both species normally fluctuates annually in response to flow conditions and other environmental factors, both populations appear to be stable.

Fine-Filter Approach: Federally Endangered, Threatened and Regional Forester Sensitive Species

Habitat for rare species is an important consideration when assessing potential impacts to biological diversity. Each TES and RFSS species is categorized depending on its known occurrence and available habitat. The BA/BE analyzes each species and determines if the project area provides no suitable habitat, suitable but unoccupied habitat, or occupied habitat. Determinations provided in the BA/BE are supported with detailed information on the life history, habitat requirements, documented occurrences within the project area and on the ANF, and other conditions or limiting factors relevant for each TES and RFSS species. The BA/BE also presents detailed information on the current distribution of each species as well as conservation measures needed to move any threatened and endangered species towards recovery. The BA/BE for the Brush Creek project were amended in January 2007 to reflect recent additions made to the ANF TES and RFSS lists. Two species, the northern long eared bat and northern water shrew, were also dropped from the RFSS list because the data that has been collected over several years concluded that these species are secure on the ANF. The following analysis has incorporated these changes, which are more thoroughly discussed in the BA/BE.

Six federally listed threatened or endangered species have been discussed in the BA. These species include Indiana bat, bald eagle, clubshell mussel, northern riffleshell mussel, northeastern bulrush, and small whorled pogonia. Officially designated critical habitat does not occur for any federally listed species within the ANF. The BCPA does not provide suitable habitat for two of the six federally listed species: (1) northern riffleshell mussel and (2) clubshell mussel.

The BCPA and most of the ANF provide suitable but unoccupied habitat for the small whorled pogonia. Potentially suitable habitat for this species includes approximately 100,000 to 150,000 acres of land on the ANF (USDA-FS 1998). Small populations of this federally threatened orchid occur within 15 miles of the ANF. However, the small whorled pogonia has not been documented on the ANF or in the BCPA with over 10 years of on-site monitoring. Surveys in 1990, 1991, 1996, 1997, 2003, 2004, and 2005 of all potentially suitable habitats within the BCPA documented no occurrence of this plant. The occurrence of the small whorled pogonia on the ANF may be influenced by limiting factors such as deer browsing and dense fern cover that out-competes the plant.

The northeastern bulrush was proposed as an endangered species on November 8, 1990. Nine historical collections are known from five Pennsylvania counties of which four have been destroyed. A forest-wide wetland plant survey conducted by the Western Pennsylvania Conservancy (WPC) in 1989-90, sampling nearly 130 sites across the ANF, was not able to detect this species (WPC 1989). Four of the survey sites were located in the BCPA in the McCray Run, Scott Run, West Branch Millstone Creek (upper section), and Muddy Forks watersheds. Ongoing County National Heritage inventories across two counties within the ANF have not located any populations to date. The WPC surveyed within the ANF proclamation boundary during 2006. In addition, this plant was not found during a plant survey of the Clarion River watershed by Williams (1994). There are no known occurrences of the northeastern bulrush within the ANF.

Five acres of wetlands have been identified in the analysis area, which provide a limited amount of potentially suitable habitat for the northeastern bulrush. These wetlands are associated with

riparian areas along the West Branch Millstone Creek, East Branch Millstone Creek, Lick Run, Scott run, and McCray Run. The northeastern bulrush was not documented in field surveys by district specialists for the BCP.

Bald eagles have been cited foraging along rivers, large streams and lakes on the ANF. Within the BCPA, bald eagles have been observed, during the winter, eating carrion on FR387 and also flying and roosting in the Upper Millstone drainage. This area has been extensively searched for nests, but none have been found. Due to eagle documentation in the project vicinity, it can be assumed that they are occasionally within the BCPA. While there is suitable nesting habitat, no nests have been found; the area continues to provide foraging opportunities in the form of streams and ponds.

The one federally listed endangered species that may be affected by the BCP is the Indiana bat. The BCPA is considered suitable unoccupied habitat for the Indiana bat. Surveys conducted over 7 seasons have resulted in the capture of 165 individuals, including 5 different species but no Indiana bat. An in-depth analysis of habitat availability and effects to the Indiana bat from the implementation of this project can be found in the BA. Details of how the determination was decided "may affect, not likely to adversely affect the Indiana bat, can be found in the BA. The availability of potential roost trees within the project area has been increasing in recent years and is expected to increase in the future.

The BCPA provides occupied habitat for four species of the 60 RFSS: (1) timber rattlesnake, (2) ski-tailed emerald, (3) mountain brook lamprey, and (4) gilt darter, suitable unoccupied habitat for 29 species, and no suitable habitat for the remaining 27 species. These are listed in Table 19.

Table 19. Status of Federally Threatened or Endangered and Regional Forester Sensitive Species for the BCP

Species	Species Status[1]	Occupied Habitat	Suitable Habitat in the Project but Presence not Documented	No Suitable Habitat in the Project Area
Mammals				
Indiana bat (*Myotis sodalis*)	Endangered		**X**	
Northern flying squirrel *(Glaucomys sabrinus macrotic)*	Sensitive		**X**	
Invertebrates (Mollusks and Insects)				
Northern riffleshell (*Epoblasma torulosa rangiana*)	Endangered			**X**
Clubshell mussel (*Pleurobema clava*)	Endangered			**X**
Creek heelsplitter *(Lasmigona compressa)*	Sensitive			**X**
Green-faced clubtail *(Gomphus viridifrons)*	Sensitive			**X**
Harpoon clubtail (*Gomphus descriptus*)	Sensitive		**X**	
Long-solid mussel (*Fusconaia subrotundra*)	Sensitive			**X**
Maine snaketail (*Ophiogomphus mainensis*)	Sensitive		**X**	
Midland clubtail (*Gomphus fraternus*)	Sensitive			**X**
Mustached clubtail (*Gomphus adelphus*)	Sensitive			**X**
Ocellated darner *(Boyeria grafiana)*	Sensitive			**X**

Species	Species Status[1]	Occupied Habitat	Suitable Habitat in the Project but Presence not Documented	No Suitable Habitat in the Project Area
Rabbitsfoot *(Quadrula cylindrical)*	Sensitive			**X**
Rainbow mussel *(Villosa iris)*	Sensitive			X
Rapids clubtail (*Gomphus quadricolor*)	Sensitive			**X**
Rayed-bean *(Villosa fabalis)*	Sensitive			X
Resolute damsel *(Coenagrion resolutum)*	Sensitive			X
Round pigtoe *(Pleurobema sintoxia)*	Sensitive			X
Sheepnose *(Plethobasis cyphyus)*	Sensitive			X
Ski-tailed emerald (*Somatochlora elongata*)	Sensitive	**X**		
Snuffbox *(Epioblasma triquetra)*	Sensitive			**X**
Threeridge *(Amblema plicata)*	Sensitive			**X**
Uhler's sundragon (*Helocordulia uhleri*)	Sensitive		**X**	
Wabash pigtoe *(Fusconaia flava)*	Sensitive			**X**
White heelsplitter *(Lasmigona complanata)*	Sensitive			**X**
Zebra clubtail (*Stylurus scudderi*)[3]	Sensitive		**X**	
Birds				
Bald eagle (*Haliaeetus leucocephalus*)	Threatened	**X**		
Northern goshawk *(Accipiter gentiles)*	Sensitive		**X**	
Osprey *(Pandion haliaetus)*	Sensitive			X
Yellow-bellied flycatcher (*Empidonax flaviventris*)	Sensitive		**X**	
Reptiles				
Timber rattlesnake (*Crotalus horridus*)	Sensitive	**X**		
Wood turtle *(Glyptemys insculpta)*	Sensitive		**X**	
Plants				
Northeastern Bulrush *(Scirpus ancistrochaetus)*	Endangered		**X**	
Small whorled pogonia (*Isotria medeoloides*)	Threatened		**X**	
American fever-few *(Parthenium integrifolium)*	Sensitive		**X**	
American ginseng *(Panax quinquefolius)*	Sensitive		**X**	
Bartram shadbush *(Amelanchier bartramiana)*	Sensitive		**X**	
Boreal bog sedge *(carex magellanica ssp. Irrigua)*	Sensitive		**X**	
Bristly black currant *(Ribes lacustre)*	Sensitive		**X**	
Butternut (*Juglans cinerea*)	Sensitive		**X**	
Canada yew *(Taxus canadensis)*	Sensitive		**X**	
Checkered rattlesnake plantain *(Goodyera tesselata)*	Sensitive		**X**	
Creeping snowberry (*Gaultheria hispidula*)	Sensitive		**X**	
Hooker's orchid *(Platanthera hookeri)*	Sensitive		**X**	
Kidney-leaved twayblade *(Listera smallii)*	Sensitive		**X**	

Species	Species Status[1]	Occupied Habitat	Suitable Habitat in the Project but Presence not Documented	No Suitable Habitat in the Project Area
Mountain starwort *(Stellaria borealis)*	Sensitive		**X**	
Mountain wood fern *(Dryopteris campyloptera)*	Sensitive		**X**	
Queen-of-the-prairie *(Filipendula rubra)*	Sensitive		**X**	
Red currant *(Ribes triste)*	Sensitive		**X**	
Rough cotton-grass (*Eriophorum tenellum*)	Sensitive		**X**	
Stalked bulrush *(Scirpus pedicellatus)*	Sensitive		**X**	
Sweet-scented Indian plantain *(Hasteola suaveolens)*	Sensitive		**X**	
Thread rush (*Juncus filiformis*)	Sensitive		**X**	
White trout-lily *(Erythronium albidum)*	Sensitive		**X**	
Wiegand's sedge (*Carex wiegandii*)	Sensitive		**X**	
Fishes				
Bluebreast darter *(Etheostoma camurum)*	Sensitive			**X**
Burbot *(Lota lota)*	Sensitive			**X**
Channel darter (*Percina copelandi*)	Sensitive			**X**
Gilt darter (*Percina evides*)	Sensitive	**X**		
Gravel chub (*Erimystax x-punctata*)	Sensitive			**X**
Longhead darter (*Percina macrocephala*)	Sensitive			**X**
Mountain brook lamprey (*Ichthyomyzon greeleyi*)	Sensitive	**X**		
Mountain madtom *(Noturus eleutherus)*	Sensitive			**X**
Northern madtom *(Noturus stigmosus)*	Sensitive			**X**
Spotted darter (*Etheostoma maculatum*)	Sensitive			**X**
Tippecanoe darter (*Etheostoma tippecanoe*)	Sensitive			**X**

Notes:

1. Endangered: Listed as a Federally Endangered Species; Threatened: Listed as a Federally Threatened Species; Sensitive: Listed as a Regional Foresters Sensitive Species for the ANF by Region 9 USDA-FS.
2. Formerly called Keen's myotis.
3. Formerly called Scudder's clubtail dragonfly.

3.3 Social Environment

3.3.1 Heritage

The affected environment for heritage resources considers prehistoric and historic cultural resources. Humans have occupied what is now Pennsylvania for over 10,000 years. Within the BCPA, there exists evidence of prehistoric and historic human activities. Specifically, the presence of historic agriculture, coal prospecting, and railroad logging have been identified

through field investigations. Three historic logging railroads within the project area date to the 1880s. One railroad in particular, the Tionesta Valley Railroad, connected communities such as Winlack or Ogilvie and Loleta with Lamonaville, Parrish, Sheffield, and Hallton Pennsylvania. Winlack or Ogilvie and Loleta are historic towns located along the Tionesta Valley Railroad. In the 1930s, the Civilian Conservation Corps was active in the project vicinity.

3.3.2 Scenery

Introduction

This section describes the scenic component of the BCPA that would be affected by the alternatives if implemented. The scenery analysis is based upon the Visual Management System (VMS) (USDA-FS 1974) which is a tool that helps to meaningfully compare and contrast the existing condition of scenic resources with the future condition. The Forest Service developed VMS to help land managers create and maintain visual diversity and prevent unacceptable alteration of the natural landscape. Two primary indicators are used to measure impacts to scenic resources: (1) changes to the existing landscape character type of the project area and (2) whether the project area and alternatives meet the Forest Plan Visual Quality Objectives (VQO).

Landscape Character Type

Historically and prior to European settlement, the land was a dense climax forest. Tree species included hemlock, beech, white pine, and oak. The Seneca Nation settled along the large rivers. Deer populations were low, and a rich understory of species like hobblebush was present. After European settlement, much of the area was exploited for its rich natural resources. The hillsides were stripped of their forests to support the growing nation. Drilling for oil and natural gas occurred in concentrated areas across the Allegheny Plateau. This period of intense use dramatically affected the landscape character and changed the species composition of the resulting forests. Although the landscape on the ANF has a history of human disturbance, it now appears to be a natural forest after years of growth and management.

Today, the vegetation consists of hardwood species, and native and non-native conifers. The topography is made up of forested plateaus bisected by small streams and large rivers. Large sandstone rocks are scattered throughout the area. Numerous oil and gas wells and utility right-of-ways are found in the area.

Visual Quality Objectives (VQOs)

The Forest Plan sets measurable standards or objectives for the visual management of scenic resources by establishing Visual Quality Objectives for each MA. As defined in the Forest Plan, VQOs refer to the degree of acceptable alteration of the characteristic landscape (USDA-FS 1986a, p. A-30). VQOs are determined by analyzing three basic components:

- Variety Class – uniqueness of a landscape relative to what is common;
- Sensitivity Level – concern level of a travelway based on the expectation of viewing scenery and the amount of use;
- Distance Zones – distance and visibility of a landscape from a given travelway.

Variety Classes are assigned according to the "scenic importance of a landscape based on human perceptions of the intrinsic beauty of landform, rockform, waterform and vegetative pattern" (USDA-FS 1986a, p A-29). Variety Classes may be classified as Class A – Distinctive, Class B – Common, or Class C – Minimal. All three variety classes are present in the project area with the majority being Class B.

Sensitivity Levels (SL) are "a measure of people's concern for the scenic quality of the National Forest" (USDA-FS 1974, p 18). SLs are determined using those locations where visitors are mostly likely to view the environment: travel routes, use areas, or water bodies. Sensitivity Levels may be classified as: SL1 – high sensitivity, SL 2 – average sensitivity, and SL 3 – low sensitivity. Within the BCPA, SL1 view facilities include the SR66, Loleta Campground, SR2005, SR 3002, Songbird Sojourn Intepretive Trail, Buzzard Swamp Hiking Trail, and FR157. SL2 view facilities include the FR130, which is part of the ASL Trail in the winter, and Millstone Road (T302). Millstone Creek and the West Branch of Millstone Creek are also SL2 view areas.

Distance Zones divide the landscape into three perspectives: foreground, middleground, and background. Distance zones are determined on a case-by-case basis, but even though an area may be physically located within one-half mile of a viewpoint, it may not be visible. Hence, areas are also labeled as "seen" or "unseen." Because of the dense forest vegetation and the rolling topography, there are few opportunities in the BCPA to view middleground or background. Distance zones are determined from seen SL1 viewing facilities first, then SL2. SL3 viewing facilities are not used for evaluating distance zones.

The combined values for variety class, sensitivity level, distance zone, and management area results in a prescribed VQO or management goal for the prescription area. The five possible VQOs are Preservation, Retention, Partial Retention, Modification, or Maximum Modification. A VQO of Preservation has the most stringent visual restrictions, and a VQO of Maximum Modification has the least. The information in Table 20 describes the VQOs found within the BCPA.

Table 20. VQO Existing Scenic Conditions in the BCPA

	Desired Condition
Retention (R)	Human activities not visually evident (USDA-FS, 1986a, p. A-23), and only repeat form, line, color, and texture frequently found in the characteristic landscape (USDA-FS, 1974, p. 30).
Partial Retention (PR)	Human activities evident but remain subordinate to the characteristic landscape (USDA-FS, 1986a, p. A-19), and repeat form, line, color, or texture common to the characteristic landscape (USDA-FS, 1974, p. 32).
Modification (M)	Human activities dominate landscape utilizing natural elements appearing as a natural occurrence in foreground or middleground (USDA-FS, 1986a, p. A-17), and borrow naturally established form, line, color, or texture that it is compatible with natural surroundings (USDA-FS, 1974, p. 34).
Maximum Modification (MM)	Human activities dominate landscape but appear as natural occurrence in background areas (USDA-FS, 1986a, p. A-16), and completely borrow form, line, color, and texture (USDA-FS, 1974, p. 36).

3.3.3 Recreation

Introduction

This section describes the recreational component of the BCPA that would be affected by the alternatives if implemented. The recreation analysis is based upon the Recreation Opportunity

Spectrum (ROS) which is a tool that will help to meaningfully compare and contrast the existing condition of recreation resources with the future condition. Two primary indicators are used to measure impacts to recreation resources: (1) whether the alternatives are consistent with Recreation Opportunity Spectrum (ROS) settings, and (2) changes to recreation activities and use patterns in the project area.

Recreation Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) is a system for planning and managing recreational settings by distinguishing the varying conditions and qualities in the landscape (Clark and Stankey 1979, p 1). This distinction helps land managers to provide a diverse range of opportunities and experiences to recreationists. The following indicators help to determine ROS settings (USDA-FS, 1982):

- Access (mode of transport used within an area and the service level of roads)
- Remoteness (extent to which individuals perceive themselves removed from the sights and sounds of human activity)
- Visual characteristics (see Scenery Resources Section 3.3.2)
- Site management (the appropriate development level of recreation facilities)
- Visitor management (the degree to which regulations, controls, information, and services are apparent to the visitor)
- Social encounters (the number and type of other recreationists met in the area, along travel ways, or camped within sight or sound)
- Visitor impacts (the effect of visitor use on resources such as soil, vegetation, air, water, and wildlife)

Using these indicators, recreational settings are arranged along a continuum of six ROS classes, progressing from least to greatest development: Primitive, Semi-Primitive Non-motorized, Semi-Primitive Motorized, Roaded Natural, Rural, and Urban (USDA-FS 1982, p 5). The ANF Forest Plan, which provides the overall direction, standards, and guidelines for developing recreation across the ANF, uses this ROS classification system to manage recreational settings according to management areas. This classification is the desired condition of the management area. On the ANF, ROS classes range from semi-primitive non-motorized to rural.

The BCPA is located in roaded natural (MA 1.0 and 3.0) and semi-primitive motorized (MA 6.1) ROS settings. Roaded natural is characterized as predominantly natural-appearing, with moderate sights and sounds of human activities and structures (USDA-FS 1986a, p A-23). Semi-primitive motorized is characterized as having moderately dominant alterations by humans, with strong evidence of permanent roads and/or trails (USDA-FS 1986a, p A-25).

Table 21 describes each setting indicator for the desired condition of the ROS class.

Table 21. Characteristics of Roaded Natural and Semi-Primitive Motorized ROS Classes

	Roaded Natural	Semi-Primitive Motorized
Access	A system of roads and trails permits entry for a variety of management purposes and may be open or closed to specific vehicles or types of uses. The forest is accessible by foot, horseback and motorized vehicles.	The forest is accessible by foot, horseback, or motor vehicle. Administrative use may be conducted at times using motor vehicles.
Remoteness	Recreation experiences allow affiliation with groups or isolation from sights and sounds of man at different times and places.	The recreational experience provides for a high probability of experiencing isolation, independence, closeness to nature, self-reliance with challenge and risk present.
Site Management	Resource modification and utilization takes place but is harmonized with environment. Moderately developed recreation facilities with user conveniences.	Minimally developed recreation facilities for resource protection.
Visitor Management	Few opportunities for challenge or risk. Obvious control of users.	There are minimal on-site controls and restrictions.
Social Encounters	Visitor interaction is low to moderate.	Visitor interaction is low.
Visitor Impacts	Evidence of other users is prevalent.	There is evidence of other users.

Source: USDA-FS 1985b

The degree to which the current condition of the project area meets the desired characteristics of the ROS class is a useful indicator of the area's recreational value, and can help inform future management decisions. Using predetermined standards, the existing condition or proposed condition can be said to Exceed (conditions exceeding the norm); Meet (normal conditions expected to be found in the setting); be Inconsistent (conditions incompatible with the standard, but which may be necessary to meet other management objectives); or be Unacceptable (conditions not acceptable under any circumstances). Table 22 identifies the existing conditions for the project area.

Table 22. Existing Conditions by ROS Setting Indicators for Roaded Natural and Semi-Primitive Motorized Classification

Setting Indicators	Desired Characteristics	
	MA 1.0 and 3.0 (Roaded Natural)	MA 6.1 (Semi-Primitive Motorized)
Access	Meets	Inconsistent
Remoteness	Meets	Meets
Site Management	Meets	Meets
Visitor Management	Meets	Meets
Social Encounters	Meets	Meets
Visitor Impacts	Meets	Inconsistent

Brush Creek Roaded Natural Area: Most of the project area is classified as Roaded Natural. The system of roads and trails in the project area provides full access to the Roaded Natural Area. SR 2005 and SR 3002 (Loleta Road) and FR 130 (Lamonaville Road) are the main traffic arteries through the project site and are state or township roads. There are also many other gated roads that are open to foot travel. Remoteness is of little relevance in a Roaded Natural area, but is attainable in much of the general forest area, along the numerous creeks, and behind many of the gated roads. Recreational facilities are limited and where present, are rustic and meet site management norms. Visitor management is slight but noticeable as gated roads and signs are common. However, they tend to harmonize with the natural environment. Signs and other on-site controls are not overly noticeable. Social encounters are high along SR 2005, SR 3002, FR 130, and FR 157, but low everywhere else, especially during the week. Loleta campground has moderate social encounters. Visitor impacts are low and dispersed camping, hunting, and fishing along the road system is typically light except during the peak summer camping season on weekends. There are soil impacts from illegal OHV use and vegetation disturbance from occasional footpaths or equestrian trails, but subtle site hardening is the norm in this ROS classification.

Brush Creek Semi-Primitive Motorized Area: There is not a lot of Semi-Primitive Motorized Area within the project boundary, but where it is located is inconsistent with access standards because FR 377 and FR 387 have a traffic service level (TSL) C roads. TSL D roads are the norm for this ROS classification. The other Semi-Primitive Motorized areas are consistent. A sense of remoteness can be experienced within the project area. Site development is minimal in this area. Visitor management is again limited to a couple of gated or closed roads that harmonize with the natural environment. Social encounters are high along FR 130, but low everywhere else, especially during the week. Visitor impacts are low and dispersed camping, hunting, and fishing along the road system is typically light except during the peak summer camping season on weekends. There are soil impacts from illegal OHV use at the pipeline crossing Millstone Creek, and vegetation disturbance from occasional footpaths, but site hardening is mostly subordinate.

Only one stand proposed for treatment (668006) has an ROS setting of semi-primitive motorized; so nearly all proposed reforestation treatment activities are in roaded natural areas. The setting indicators will be discussed in greater detail for the roaded natural areas. To summarize the ROS setting indicators for the existing condition of stand 668006, normal

conditions are met for access, remoteness, site management, visitor management, social encounters, and visitor impacts (USDA-FS 1982).

Recreation Activities and Use Patterns

Not every acre of the ANF receives the same type or amount of use. Areas near campgrounds, trailheads, and trails receive the highest amount of recreational use while areas near large stream corridors or lakes receive a moderate amount of use in the form of dispersed recreation (i.e. camping, fishing, and hunting). General forested areas tend to receive the least amount of use. The recreational areas and activities identified in this section are those that generally receive the greatest attention by recreationists in the project area.

Developed Recreation: The lower camping loop of Loleta Recreation Area (Development Level 4 Campground with 38 sites) is located within the project area, and the day-use facilities and the upper camping loop are just outside. Loleta is popular for tent camping, RVs, swimming, fishing, and picnicking. Historically, Loleta was the location of a logging town with more than 600 inhabitants. When the timber supply was exhausted, the mill shut down, and in the 1930s, the Civilian Conservation Corps built it into a recreation area that included a bathhouse, swimming area, picnic shelters, and landscaping.

Hiking Trails: The Buzzard Swamp Trailheads on FR 376, FR 377 and FR 157 (which is also the trailhead to the Songbird Sojourn Interpretive Trail) are all located within the BCPA. The Songbird Sojourn Trail is 1.6 miles and receives moderate use. The Buzzard Swamp Trailheads are part of a 9.6 mile interconnecting system of trails where viewing wildlife, mountain biking, fishing, and cross country skiing are all popular activities. The Buzzard Swamp area emphasizes wildlife management and is also a moderately used by recreationists. Motorized use of the trails is not allowed. Light equestrian use can be seen around FR 559. The Loleta Trail is also located on the perimeter of the project area.

Motorized Trails: All Off-Highway Vehicle (OHV) use is restricted to designated trails throughout the ANF. The BCPA does not have any designated OHV trails located within its boundaries, nor is any of the project area associated with an Intensive Use Area (IUA) designated for such use. Illegal OHV activity does occur in the project area near private residents and camps along FR 760, FR 767, and at the pipeline crossing on FR 132. The ASL Trail is also found within the project boundary and uses FR 130. In most instances in this area, snow is short-lived or too scant to provide quality snowmobile trail riding. Deep snow that lasts the whole season is present, on average, only once every 8-10 years. On average, snowmobiling activities do have sufficient snow for 28 days. When snow cover is present, trail use is high, especially on weekends. Although some illegal use does occur, snowmobile use is limited to designated trails only because of safety concerns with mixing vehicular and snowmobile traffic, and because the noise from snowmobiles affects some recreationists who are seeking solitude and remoteness.

Dispersed Camping: There are numerous dispersed camping sites found in the project area particularly Millstone Road (FR 132). Other roads used for dispersed camping include FR 157, 376, and 377. Dispersed camping is most popular during hunting season.

Hunting and Fishing: Hunting in the Brush Creek project area is heaviest during deer season, but relatively low at other times of the year. Turkey, deer, grouse and other game are all hunted, and the opening day of rifle deer season receives the heaviest use. Parking is usually in short supply on the first day of rifle season when hunters park all along the forest roads. There are a number of parking areas located along SR 2005, SR 3002, and FR 130 but more are needed.

There are no disabled hunter roads located within or adjacent to the BCPA. Fishing opportunities are available within the project area. The West Branch of Millstone Creek is stocked with trout and a very popular place to fish. The East Branch of Millstone is also a popular spot, particularly near Loleta. In general, fishing use is heaviest during the first few weeks of spring trout season. The forest roads are often soft in the spring when trout fishing is at its peak. During this period, the amount of parking is in short supply.

High Recreation Use Corridors: A roads or trail is identified as a high recreation use corridor if it has a Sensitivity Level (SL) of 1. SLs are primarily used during the scenery management process, but they are also useful for describing the relative importance that an area or travelway has to recreationists. All major highways, roads with heavy recreational traffic, entrances to developed recreation sites, scenic roads, and all hiking trails have an SL of 1. Within the BCPA, high recreation use corridors include SR 66, SR 2005, SR 3002, FR 157, the Songbird Sojourn Trail, and Buzzard Swamp Hiking Trail.

Special Events or Unique Features: During the spring (March 1-April 30) and fall (September 15-November 30), bird dog trials take place along FR 130 (Lamonaville Road) and SR 2005 and SR 3002 (Loleta Road). The actual dates vary from year to year. The trials consist of running trained bird dogs though a number of existing courses with dog handlers on foot and judges on horseback following behind. The Lamonaville Road courses lies to the north of FR 130 beginning just west of FR 559 and stretching east beyond the project boundary. The Loleta Road courses lies to the west of SR 2005 and SR 3002. During the event, there is not adequate parking along SR 2005, SR 3002, or FR 130.

Other Recreation: A multitude of other recreation pursuits are common in the project area and include mountain biking, walking, firewood cutting, scenic driving, and target shooting. High bush blueberry picking is popular in the Loleta area along Laurel Run. Forest Road 131, known by locals as "the grade," is a scenic road where many people enjoy driving for pleasure. This road ends right at the project boundary.

3.3.4 Economics

Jobs and income in McKean, Warren, Forest, and Elk Counties are affected by activities on the ANF through direct employment as well as products and services that are generated from activities on the NFS lands. Timber sale returns generated from the ANF are payable to the U.S. Treasury. Oil and gas development within the project area affects the local economy through private employment and income generation, since subsurface rights are reserved and outstanding.

The main non-priced services include recreation opportunities, such as camping, hunting, fishing, boating, hiking, and wildlife viewing. Non-local recreation users of the ANF contribute to the local economy as they pass through or stay overnight in the local communities. In 2005, Elk and Forest Counties elected to receive funds from Title I and III of the Secure Rural Schools and Community Self-Determination Act of 2000 (Secure Rural Schools Act) (USDA-FS 2005c). This law provides new funds to counties in lieu of receiving payments for National Forest timber sales (25 percent fund). It allows counties to receive enhanced payments and designate a percentage of those payments for forest or county projects, in addition to the traditional uses for schools and roads. For the future, there remains uncertainty as to whether or not the Secure Rural Schools Act will be renewed or whether the level of payments will continue. No identified environmental justice areas or communities are in the region, although low-income and minority citizens live in the region.

3.3.5 Human Health and Safety

Humans utilize most of the BCPA. Most of that use is scattered, intermittent, and of short duration. The types of human uses or activities include camping, hiking, hunting, fishing, wildlife observation, timber harvesting, reforestation activities, and oil and gas extraction activities. The following discussion summarizes, from a human health and safety standpoint, the existing condition of the proposed treatment areas.

Portions of the project area contain dead or dying trees. Over time, those dead and dying trees would deteriorate and become vulnerable to wind stress or other natural forces that could cause them to fall. Dead, dying and falling trees are a natural part of the forest. ANF users should be aware of and expect a level of risk associated with this natural process. Dead trees along roadways may lean toward the road opening and may fall after vibration or turbulent air resulting from passing traffic or during windstorms. Once on the road surface, fallen trees can be a hazard to fast moving traffic. Workers or forest users, who stop to remove them, are also at risk.

There are other inherent risks people would encounter while on the ANF. Dense understories of herbaceous woody plants that develop in pockets under partial canopies can create safety hazards. The dense herbaceous cover in many areas may conceal downed logs, rocks, holes, and other tripping hazards. Blackberry bushes can scratch, tear clothing and cause an allergic reaction in some people. Dense beech saplings have small dead twigs and sharp buds that can cause eye injury.

OGM development and extraction activities are occurring within the BCPA. Developers range from large companies to independent operators, various subcontractors, and field workers engaged in drilling, construction, well completion, and well tending. All of the OGM developments within the project area are privately owned and operated under reserved or outstanding rights, where the government owns the surface rights only. These areas contain access roads, electric lines and oil or gas pipelines and machinery that are either buried or above ground, including pump jacks, collection tanks, and other miscellaneous equipment. People working at or traveling to these OGM sites and the associated equipment are exposed to these types of hazards.

Chapter 4: Environmental Consequences and Cumulative Effects

This chapter describes and analyzes the environmental consequences and the cumulative effects (CE) that would result from implementing the alternatives. The descriptions and analyses are based on the best available information about the resources in the affected environment. The effects are described and analyzed for the following resources:

- The physical environment, including soil resources; water resources and riparian areas; transportation; air quality; and oil, gas, and minerals.
- The biological environment, including vegetation, NNIS, and wildlife.
- The social environment, including heritage resources, scenery, recreation, economics, and human health and safety.

Cumulative effects were analyzed for each resource under each alternative and have two associated scales: geographic (location) and temporal (time).

The temporal boundaries for the cumulative effects analysis for all resources, except for water resources, are from 1996 to 2026 (10 years in the past and 20 years into the future). This time period provides an overall view of the incremental impact of vegetation management and OGM activities in combination with current project proposals. The spatial boundaries for each resources are described by resource and a rationale provided for each resource.

4.1 Physical Environment

The direct, indirect, and cumulative effects to soils; water and riparian areas; transportation; air quality; and oil, gas, and mineral resources are described in the following sections.

4.1.1 Soils

The CE analysis area for soils resource is the boundary of the BCPA because soil integrity is an on-site measurement and most effects are from site level activities. Road work may occur outside the BCPA on an ongoing basis but is unlikely to affect soils within the BCPA.

The Forest Service:

1. Designs and implements management practices to maintain or improve the long-term productive capacity of the soil resource.
2. Plans and conducts soil quality monitoring to determine if soil management goals, objectives, and standards, as outlined in the Forest Plan, are being achieved.
3. Uses the results of monitoring to evaluate resource management actions and recommend adjustments to practices or mitigation measures to prevent significant impairment of long-term soil productivity (USDA-FS 1991b).

Soil Nutrients

Alternative 1: No Action

Direct and Indirect Effects

Under this alternative, no merchantable wood would be removed and no reforestation or wildlife habitat improvement treatments would occur. Carbon sequestration would be highly variable

within the BCPA depending upon the age classes of the vegetation within the stands. For instance, in stands where more mature trees grew, the rate of carbon sequestration would be the lowest among all alternatives, especially if regeneration was slow to develop and grew poorly. Likewise, carbon storage would be directly related to the volume of carbon stored in living trees, with the amount in storage decreasing as dead trees decayed. Decreases in carbon storage would be offset to a degree by the amount of carbon residing in the various components of the forest floor (litter and decomposing organic layers resting on the mineral soil surface) and that which is incorporated into the mineral soil. Stands characterized by younger, more vigorously growing trees would demonstrate a higher rate of carbon sequestration. Down woody debris would continue to accrue under this alternative.

Alternatives 3 and 4

Direct and Indirect Effects

Both action alternatives propose nearly the same categories of silvicultural and reforestation treatments, with two exceptions. Alternative 3 would treat more acres than Alternative 4; an overstory removal treatment is present in Alternative 3 and absent from Alternative 4; group selection is absent from Alternative 3 and present in Alternative 4. Wildlife treatments would be the same for both alternatives.

Both glyphosate and sulfometuron methyl herbicides would be prescribed as on the ground conditions dictate. Glyphosate binds readily to soil and becomes relatively immobile, so there is limited potential for residual effects to soil nutrients or soil biota. Sulfometuron methyl herbicide has a relatively rapid half-life in acidic soils such as those found on the ANF. Also, sulfometuron methyl is strongly adsorbed to soil particles at low pH (acidic conditions) and at high organic matter contents; therefore, little soil mobility is expected. Nonetheless it can have some residual effect on soil nutrients and is listed as being “inhibitory” for the growth and development of soil fungi and bacteria. Glyphosate and sulfometuron methyl herbicides could be prescribed as conditions dictate on the ground.

Alternatives 3 and 4 contain proposals to fertilize 241 and 144 acres, respectively. Recently voiced concerns over leaching losses of base cations associated with the use of nitrate-nitrogen fertilizers has led to a limitation on the use of this form of nitrogen. Since the concern over base cation loss is greatest on the plateau and shoulder landform positions, nitrogen application in units occupying these positions has been evaluated more carefully prior to prescribing fertilization.

When compared to Alternative 4, Alternative 3 proposes to create a greatest acreage of new, young stands, which can have a more rapid rate of carbon sequestration. Young, rapidly growing stands and wildlife plantings would have a more rapid rate of carbon sequestration. Also, under Alternative 3, which would harvest the greater volume of timber, more carbon would remain “stored” in a wood product for a longer period of time. Down woody debris would continue to accrue under both alternatives.

Cumulative Effects

Carbon sequestration may help to lower the carbon dioxide levels in the atmosphere thereby reducing the effects of global climate change. Alternative 3 sequesters a greater amount of carbon in wood products and provides for the most new, young forest, which can sequester carbon at a more rapid rate.

When base cations are lost through ongoing leaching without being replaced from other sources, the resulting situation could lead to soil and forest health concerns. Alternatives 3 and 4 propose to fertilize 241 and 141 acres, respectively. Soil acidification associated with fertilization has the potential to accelerate the leaching of base cations from the soil profile especially in stands located on the plateau, shoulder, and backslope positions. The larger amount of wood fiber removed in Alternative 3 would probably not lead to a significant reduction of base cations when compared to Alternative 4. This is because approximately one half of the nutrients reside in a tree's upper portions and branches; both of which would be left behind in any salvage or other harvest operation (Johnson and others 1997). For more on this topic, please refer to the section 3.1.1.

Three small parcels of privately owned land lie within the cumulative effects area for the BCP. Carbon sequestration on private land would be affected similarly by the processes discussed in the previous paragraphs and presumably would have no relationship with carbon sequestration on lands within the BCP CE area. Conceivably, where private land lies upstream or upslope from BCPA stands, nutrients lost from private land could migrate to the BCPA, where they would be incorporated into the biota or leached from the system as discussed in the section 3.1.1. Twenty-four acres of crop tree release were completed within the BCPA in the fall of 2006.

Although the Clean Air Act has been responsible for overall reductions of sulfur concentrations in the air, acid deposition could continue to increase the amount of nitrogen and sulfur in the soil. These increases, especially the increase in nitrate-nitrogen, would lead to continued leaching of Ca and Mg through the soil profile. This leaching would be combined with the lack of limestone and dolomite in the dominant geology on the ANF, so replenishment of these nutrients would be limited. Additionally, trees remove these nutrients from the soil and sometimes store large quantities of the nutrients in organic material depending on the species. Past and future timber harvests have and would continue to remove some of this organic material and the associated nutrients from a site. However, approximately one half of all nutrients stored in trees reside in the tops, which are normally left on site following timber harvest.

Surface Erosion

Alternative 1: No Action

Direct and Indirect Effects

In Alternative 1, previously approved activities would keep erosion and sedimentation to a minimum due to implementation of Forest Plan standards and guidelines, mitigation measures, and/or design features. No proposed activities for the BCP would occur.

Alternatives 3 and 4

Direct and Indirect Effects

Soil disturbance and exposure to erosion associated with vegetation, wildlife, and recreational management activities proposed in Alternatives 3 and 4 would cause moderate to low amounts of erosion (in project file). The erosion prediction model (Disturbed WEPP) does not take into account mitigation measures or design features implemented prior to, during, and after management activities have concluded, which would reduce or possibly eliminate potential erosion. Given the reduction in erosion, which can be assumed to occur with mitigation measures, the difference in erosion potential between each of the action alternatives and Alternative 1 would be much less than modeled and likely be minimal. Included in this project is a proposal to maintain and manage wildlife openings and to enhance a savannah, which would

require agricultural practices, i.e., disking to prepare the soil for seeding and to control competing on site vegetation, the seeding of an appropriate plant mix for wildlife, and the application of lime and fertilizer. Disking would remove most of the existing cover prior to seed bed preparation and seeding, increasing the potential for soil erosion to occur. On relatively bare sites like this, the degree of erosion would be a function of percent surface cover, percent slope, length of slope, soil texture, and rainfall. Consequently, erosion losses have the potential to be higher than those associated with other types of treatment. However, soil erosion losses would be lessened by the quick establishment of desired vegetation, and greatly influenced by the amount and timing of rainfall occurring during the establishment phase.

Soil disturbance would be kept within Forest Plan requirements by using Forest Plan standards and guidelines, Interim Soil Guidelines, mitigation measures, and design features. Soil erosion would increase in treated areas primarily from skid trails and log landings until vegetation is re-established. The projected disturbance would not exceed 15 percent of any unit (USDA-FS 2001a). Erosion potential would quickly return to pretreatment levels after the year of disturbance. Soil disturbance would be less with management practices such as the use of low ground pressure equipment and/or seasonal operating restrictions.

Site preparation, tree shelter installation, tree and shrub planting, and release activities employed as part of the reforestation and wildlife components of this project would have minimal effects on the soil resource because, for the most part, these activities are carried out by work crews using hand held equipment. Any plant material cut in the course of these activities, as well as that already lying on the ground, would be left in place on the site, adding to and maintaining a layer of cover to protect against soil erosion. Area fencing, which relies on motorized vehicles for the initial construction and future maintenance of the fence, would require an approximately 10 foot wide access trail around the perimeter of the fence. Woody debris and vegetative cover growing on the trail would suppress soil erosion from these sites. Additionally, if soil erosion was noted during fence inspection and maintenance visits, water bars or other erosion control methods would be employed to alleviate the problem.

Alternatives 3 and 4 propose about 17 miles of road maintenance, three miles of road decommissioning, and 0.5 miles of limestone resurfacing. If implemented, these actions would help minimize the effects of erosion and sediment deposition associated with the future operation of the treated roads. Short term erosion and sedimentation occurring during and immediately after the maintenance activities could be minimized through the standard engineering and mitigation measures associated with this activity. Also, under Alternatives 3 and 4, six pits and four pits would be expanded by a total of six acres and four acres, and two new pits and one new pit would be developed for an additional four acres and two acres of pit development, respectively. Pit expansion and development would conform to the standard engineering and mitigation measures for such activities.

Cumulative Effects

No major vegetation management activities have occurred within the CE area within the past 10 years. Twenty-four acres of crop tree release work were recently completed within the CE area in 2006. As discussed earlier, minimal ground disturbance occurs with this type of activity. Future management activities within the CE area would conform to Forest Plan standards and guidelines to minimize the potential for erosion and sedimentation and other forms of detrimental soil disturbance.

About 99 acres of private land lies within the CE area. Commercial timber management has not been a high priority of these landowners and this is not anticipated to change into the future.

Road construction and use on both National Forest land and lands held under other jurisdictions, including activity by oil and gas lessees, can cause high rates of erosion and sedimentation. The Forest Service is currently evaluating a road right-of-way easement request from Seneca Resources, Inc. to construct about 0.3 of access road southwest from FR 760 to access their property east of the West Branch Millstone Creek in Jenks and Barnett Townships (see Map 3). Standards and guidelines and mitigation measures used by the Forest Service and Best Management Practices (BMPs) created by the Pennsylvania Department of Environmental Protection help to minimize the erosion created by road construction and maintenance and the volume and type of traffic these roads support.

Past and potential future activities within the CE area could cause soil disturbance, but recent soil quality monitoring indicates that the potential for this is low. If expansion of oil and gas activities such as road building and well pad construction occur, this activity could create areas of long-term detrimental soil compaction unless rigorous construction and mitigation standards are applied. Soil compaction created by roads (forest roads, municipal roads, and lessee roads) and any other administrative facility (buildings, parking lots, designated trails, etc.) is not included in the Forest Service, Eastern Region soil quality standards (USDA-FS 2005a).

District records show there are currently 26 active and 28 inactive/plugged/unknown OGM wells within the BCPA. At the current rate of development on the ANF, it is anticipated that an additional 84 wells could be drilled over the next 20 years within the BCPA. Future development at this scale could create an additional 63 acres of permanent openings and an additional 9 acres of pit expansion to provide the stone for the developments. Forest Plan standards and guidelines, mitigation measures, and design features required by the Forest Service and Best Management Practices (BMP) created by the Pennsylvania Department of Environmental Protection help minimize soil erosion and sedimentation created by road construction and maintenance and the traffic and activities these roads support.

Soil Compaction

Alternative 1: No Action

Direct and Indirect Effects

Previously approved activities and previously accomplished vegetation management, wildlife management, and recreation activities can cause detrimental soil compaction. Soil quality monitoring has not shown any major violations of the Forest Service, Eastern Region soil quality monitoring guidelines. As expected, Alternative 1 would create the least soil compaction of the three alternatives.

Alternatives 3 and 4

Direct and Indirect Effects

The largest acreages of vegetation treatment, and therefore, the highest potential for detrimental soil compaction, are proposed under Alternatives 3 and 4. Recent monitoring results indicate that potential compaction and other physical and detrimental soil disturbances under either action alternative would not exceed 15 percent of any stand. Existing mitigation measures and guidelines would limit the amount and extent of detrimental disturbance from vegetation management activities (USDA-FS, 2005b).

Road maintenance and limestone resurfacing activities could conceivably result in some compaction, but it would occur on already highly compacted and preexisting road surfaces. Over the long term, road maintenance would prove beneficial at reducing soil erosion as explained in the previous surface erosion section. Removal of stone from the proposed pit expansions and development would remove soil and unconsolidated stone down to bedrock, but the greatest area of soil affected by this activity would be limited to the area directly overlaying the stone to be removed or where topsoil is stockpiled. Once the usable stone was depleted, the site would be recontoured with the previously stockpiled soil and revegetated.

Herbicide, fertilization, and fencing treatments using heavy equipment have the potential for soil compaction, but even these treatments, when applied with the standard mitigations, would most likely cause a minimal adverse impact to the soil resources. Herbicide is applied by a sprayer in swaths 80 to 100 feet wide, which minimizes the number of passes a machine would make in each spray stand, with a concurrent reduction in the potential for compaction. Fertilizer is applied by a sprayer in swaths 40 to 50 feet wide. Herbicide and fertilizer equipment use existing skid trail, etc. to minimize soil disturbance. Fence building and maintenance activities have a potential for compaction and erosion in a roughly 10-foot wide zone along the perimeter of the fence used as a travel way to access the fence with mechanized equipment. However, the effects of these factors are minimal, because the travel way is often vegetated or covered with slash and larger pieces of debris, which acts as a cover to minimize rainsplash erosion and possibly soil compaction. Soil compaction is further minimized by keeping the use of mechanized equipment to a minimum through the use of hand tools or portable gas powered augers, which are commonly employed for planting jobs. Tree shelter installation would cause minimal soil compaction due to the localized nature of this task.

Please refer to Table 11 to note the differences in the acreages proposed for each type of treatment under the action alternatives. Overall, the greatest potential soil compaction is possible under Alternative 2.

Cumulative Effects

Past, present and potential future activities within the CE area could cause soil disturbance, but recent soil quality monitoring indicates that the potential for this is low. If expansion of oil and gas activities such as road building and well pad construction occur, this activity could create areas of long-term detrimental soil compaction unless rigorous construction and mitigation standards are applied.

Soil quality monitoring from 1990 to 2000 determined that 10 stands out of 27 monitored exceeded the Forest Plan standard (USDA-FS 2002b). Soil quality monitoring examined the effects of vegetation management on seven categories of detrimental soil disturbance, where the most applicable categories to the ANF are compaction (measured as a 15 percent increase in bulk density), displacement, puddling, and accelerated erosion. Results of the monitoring led to the creation and implementation of interim soil guidelines (USDA-FS 2001) to help limit the categories of detrimental soil disturbance to less than 15 percent of a stand's area. The interim guidelines were later superseded by a Forest Service, Eastern Region supplement to the Forest Service Handbook dealing with soil monitoring (USDA-FS 2005a).

Monitoring from 2002 to early 2005 included 63 stands with 642 transects where data were recorded. There were 36 stands with less than 5 percent detrimental disturbance, an additional 14 stands with less than ten percent disturbance, an additional eight stands with less than 15 percent

disturbance, and only five stands that exceeded the 15 percent area standard (USDA-FS 1986a, p 4-21; USDA-FS 2005b).

Exceeding the 15 percent standard for these five stands during the 2002-2005 period, highlighted the need to address soil moisture at the time of harvest (at least three of the five stands were harvested during months when precipitation was double the monthly average). Assessment of soil moisture prior to and periodically throughout the harvest can help to ensure that soil moisture in not at a point where soils are susceptible to compaction. Previously, the ANF relied on soil drainage group data determined during project planning to set the time of year for both the type of activity and equipment allowed. It was decided that these stands would not receive any specialized treatment, such as scarification or deep tillage, to reduce the degree of compaction in order to avoid any detrimental effects associated with the treatments.

A possible explanation for the five stands exceeding the 15 percent standard, may relate to heavy rainfall causing wet soil conditions during the 2004 operating season. Wet conditions would make Groups 1 and 2 soils more susceptible to compaction. The results of the 2004-2005 soil quality monitoring highlight a need to closely monitor site conditions during harvest activities on all soils to ensure that detrimental soil disturbance, namely compaction, stays below 15 percent. Nonetheless, the results do indicate that successive vegetation management activities can be done without causing detrimental soil disturbance in excess of the Forest Plan Standard. Consequently, the risk of cumulative compaction in the CE area is low with the recommended timber harvest monitoring to ensure continued compliance with these standards. Remediation efforts may be employed if a stand displays soil compaction in excess of the standard.

New road construction and parking areas would result in new areas of highly compacted soils. These facilities would be designed and constructed to ensure that the affected surface area would be no larger than necessary to construct them to the appropriate design standard, including utilizing existing corridors and opening where possible.

It is reasonable to foresee that OGM development across the analysis area would continue resulting in additional areas with long-term compaction due to road and well pad construction. These activities, and any associated road building and maintenance, could create areas of long-term detrimental soil compaction if Pennsylvania BMPs and Forest Plan standards and guidelines are not applied.

Monitoring

The action alternatives would require soil quality monitoring in a sample of treated stands. Pre-harvest monitoring, if feasible and post-harvest monitoring for soil quality indicators would be carried out in accordance with current regional direction (USDA-FS 2005a). Also, other ground disturbing activities would be monitored following regional direction (USDA-FS 2005a). All monitoring data would be used to assess the need for adaptation of activities, to assess the effectiveness of soil conservation practices, and to assess the need for corrective action where detrimental soil disturbances exceeded standards.

4.1.2 Water Resources and Riparian Areas

Cumulative water resource effects are the estimated shifts in water quality, streamflow regimes, and stream channel morphology that might occur.

Analysis Boundary: The direct and indirect effects of the three alternatives will be assessed according to their potential impacts on nearby streams. Cumulative Effects (CE) will be analyzed at the outlets of two 6th field subwatersheds: East Branch Millstone Creek and West Branch Millstone Creek. Four other subwatersheds are incidentally overlapped by the BCPA. However, there is little or no activity proposed in these drainages and no further discussion or analysis of these subwatersheds will be completed. Beyond the subwatershed level, it is assumed that the cumulative effects of the proposed activities would be masked or diluted to the point that ties with potential site disturbance would not be apparent or measurable.

Analysis Period: Unless otherwise specified for a given activity or effect of activities, the time frame for cumulative watershed effects begins in 2001 and extends through the proposed implementation of the BCP and ends in 2017, five years after the last proposed activity. This timeframe for the CE analysis is intended to include any previous effects of management and natural activities cumulatively with current, proposed, and reasonably foreseeable future activities.

Healthy forests are synonymous with healthy watersheds. Under forested conditions, surface runoff and soil erosion are low because existing vegetation intercepts raindrop impacts, amounts of surface litter are high, infiltration rates are generally high, and a well-developed macropore and subsurface flow are present. However, silvicultural treatments can cause disturbances that can temporarily impact runoff and erosion from forests during and after regeneration harvests and during the stand initiation stage.

Water resources effects, whether positive or negative, are generally proportional to the amount of vegetation removed and the proximity of proposed actions to water bodies, seeps, and springs. Each alternative would have positive and negative effects. Any negative impacts that could occur for each alternative are local (on site) and short-term (less than a decade in duration). These impacts can be mitigated by following Forest Plan standards and guidelines, mitigation measures, and design features.

Streamflow Regime

Alternative 1: No Action

Direct and Indirect Effects

Under the no action alternative, any direct and indirect effects associated with road derived runoff would continue to alter streamflow regimes, possibly resulting in degraded CE in both subwatersheds.

Streamflow regimes in the BCPA have likely been modified by the presence of roads and other compacted areas on the landscape. These hardened areas have the potential to affect surface and subsurface hydrology and have a longer lasting affect where hydraulic connectivity exists between road drainage and the stream network. In Oregon, Wemple and others (1996) found that road segments hydrologically connected to the channel network in increase flow routing efficiency, which may be observed as increases in peak flows. The BCRAP (USDA-FS 2004a) identified several road segments as exhibiting connectivity to stream channels where ditch lines are routing runoff directly to streams. Therefore, it is likely that the streamflow regime has been modified by the presence of the current road network and these modifications are likely to appear as increases in peak flow magnitude and decreases in response time. Such changes in the streamflow regime can result in channel modification where channels are susceptible to such influences.

Alternatives 3 and 4

Direct and Indirect Effects

Both action alternatives would reduce the level of hydrologic connectivity which exists between the existing road system and BCPA stream networks and should result in less CE in each of the subwatersheds. The road treatments proposed in the two action alternatives are shown in Table 11 and were designed to reduce the impacts of the existing road system on the areas streamflow regimes. Several of the road segments that are proposed for improvements or decommissioning currently pose a high risk of negatively impacting streamflow due to their close proximity to stream courses, and they were recommended for treatment in the BCRAP (USDA-FS 2004a.)

Timber harvest activities proposed in alternatives 3 and 4 have the potential to change streamflow regimes at some scale. While proposed harvesting is not likely to directly affect streamflow regimes due to use of riparian buffers, it could potentially result in indirect effects which could include increases in water yield and increases in summer low flows. These increases are measurable when more than 25 percent of the basal area is removed from a drainage area. Alternatives 3 and 4 would result in 8.5 percent and 7.9 percent basal area reduction in both the East Branch and West Branch Millstone Creek subwatersheds, respectively. This level of reduction has the potential to increase water yields in small tributaries immediately adjacent to harvest areas. However, further downstream, as the watershed contributing area increases, the effects would quickly become diluted and would not be measurable at the outlet of either 6th field sub-watershed.

Other proposed activities that have the potential to impact the streamflow regime include the construction of new roads. New roads can affect the routing of water through watersheds by intercepting, concentrating and diverting surface and subsurface flows from their natural pathways. These changes in water routing can indirectly affect streams by increasing the volume and changing the timing of peak flows (Wemple and others 1996). Roads can also modify surface hydrology to some degree as a result of the nature of the road prism on the landscape (e.g., loss of vegetation, compaction of soils, and modification of slopes.) Furthermore, where road cuts come in contact with a flow restricting layers, subsurface flows can be intercepted by the road prism and become surface runoff (USDA-FS 2003).

However, the probability of the proposed new road having a direct, indirect, or cumulative effects on either of the subwatersheds is minimal since the new road construction in Alternatives 3 and 4 would be located more than 300 feet from any stream and Forest Plan standards and guidelines for road design would be followed to reduce the impacts of runoff and erosion. Furthermore, new roads would be constructed to meet Pennsylvania BMPs, which should prevent any major impacts from occurring.

Cumulative Effects

The only previously approved vegetation management proposals or road activities on NFS lands within the BCPA are about 24 acres of crop tree release, which were completed in the fall of 2006. This activity should have minimal ground disturbance, and therefore, no direct or indirect effects to streamflow regimes. Increases in streamflow are measurable during the short-term (<10 years) when more than 25 percent of the basal area is removed from a drainage area (Hornbeck and Kochenderfer 2000). The total reduction in basal area should range between 6.5 to 8.5 percent in the East Branch Millstone Creek and West Branch Millstone Creek drainages. It is highly unlikely that these values would greatly increase with the implementation of future projects. Future timber harvests are not expected to have adverse effects on streamflow regimes

as detailed analysis would be completed; impacts would be mitigated; and streams would be adequately buffered. Therefore, there should be no measurable cumulative effects on streamflow regimes in either drainage resulting from the proposed activities.

Private timber harvests in the subwatersheds are also likely to occur within the next ten years. These activities follow stricter BMPs so they are not likely to increase the cumulative impact on the streamflow regimes through watershed-wide reductions in basal area or increases in the amount of compacted areas. The Forest Service owns a majority of the surface rights in both subwatersheds; 98.5 percent in East Branch Millstone Creek and 59.0 percent in West Branch Millstone Creek. As a result, it is highly unlikely that private vegetation management activities would have a substantial impact on either drainage.

It is reasonable to assume that oil and gas development will continue throughout the BCPA and may result in additional impacts on stream flow regimes as new roads and well pads are constructed. Pennsylvania BMPs set guidelines for road and well pad construction for operators, but they are not as extensive as Forest Plan standards and guidelines, especially when it comes to road surfacing requirements. Existing oil and gas road conditions could be improved through cooperation with operators to bring road conditions up to Pennsylvania BMPs in the BCPA, which would reduce the hydrologic connectivity between the existing road and stream networks.

Water Quality

Alternative 1: No Action

Direct and Indirect Effects

Any direct and indirect effects associated with road derived runoff could continue to have negative cumulative effects on water quality in the BCPA. Non-system road networks within the BCPA have increased the amount of fine sediment available to the stream networks. Since road segments are hydrologically connected to the stream network, road derived sediments are being transported to and depositing in the stream channels. Where the amount of sediment exceeds the stream's ability to transport it downstream, deposition is occurring within the stream channels. Where deposition is extensive enough, the protected use of aquatic life may be impaired.

Alternatives 3 and 4

Direct and Indirect Effects

Impacts of disturbances such as timber harvests and roads on sediment flow in streams are reduced through use of filter strips (Lynch and Corbett 1991; Elliot and others 2000) included in the standards and guidelines for the ANF (USDA-FS 1986a, p 4-23). The addition of limestone at stream crossings would reduce the amount of fine sediment entering streams. Although erosion may return to pre-logging conditions when logging stops, sediment may continue to flush through the drainage system for more than a decade (Swank and others 2001). Sediment delivery would be mitigated by following standards and guidelines in the Forest Plan, interim soil guidelines (USDA-FS 2001a) and mitigation measures and design features identified in Chapter 2.

Clearcutting studies have demonstrated small and short-term increases in some nutrient runoff after harvest, and a return to pre-harvest levels with forest re-growth (Neary and Hornbeck 1994; Swank and others 2001). Nutrient leaching also increases as forests mature, and this may affect water quality (Hornbeck and Kochenderfer 2000). The amount of late-successional forests will increase in the BCPA from less than one percent to 11 percent over the next 20 years. Nitrogen

levels may increase in area streams as forest stands within the BCPA mature, but not at levels that would exceed water quality standards.

Water temperature changes can occur if streamside shade is decreased due to removal of vegetation. Forest cover provided by riparian buffers, which the ANF uses, also helps maintain stream temperature and reduces impacts on water resources; therefore, water quality would not be adversely impacted by the proposed activities.

Riparian buffers would be used to ensure that mature trees are retained as a source of organic matter (large woody debris). Changes in aquatic habitat could occur due to direct intrusion of equipment into riparian areas. This impact is mitigated by buffers required by the ANF (USDA-FS 1986a, p 4-23).

Implementation of any one of the action alternatives would reduce the level of hydrologic connectivity, which exists between the existing road system and BCPA stream networks and should result in less CE on water quality in both subwatersheds. The road treatments proposed in the two action alternatives are shown in Table 11 and on Maps 2 and 3 and were designed to reduce the impacts of the existing road networks on BCPA streams. Several of the road segments that are proposed for improvements or decommissioning were identified during the BCRAP (USDA-FS 2004a) as currently contributing large volumes of sediment to neighboring streams.

Because the FS will limit adverse effects to stream flow regimes and follow Pennsylvania BMPs, relatively little water quality cumulative effects are expected as a result of proposed activities.

Cumulative Effects

There are no previously approved timber harvest activities within the BCPA. Future FS timber harvests are not expected to have adverse effects on water quality as detailed analysis would be completed; impacts would be mitigated; and streams would be adequately buffered.

Private timber activities within the next ten years in these drainages are required to follow Pennsylvania BMPs. These activities are not likely to exacerbate sedimentation issues where new roads are constructed.

OGM can cause sediment and chemical pollution of streams, and thus harm aquatic like and humans (USDA-FS 1986a). It is reasonable to assume that OGM development would continue throughout the BCPA and CE area. Pennsylvania BMPs set guidelines for road and well pad construction for operators. Forest Service works with operators to minimize their impacts to the surface and to identify and correct problems associated with their developments. Currently, about 0.4 percent of the BCPA is occupied by OGM well sites and access roads. Future OGM development is expected to occur on an additional 0.65 percent of the BCPA.

Stream Channel Morphology

Alternative 1: No Action

Direct and Indirect Effects

Road networks throughout the BCPA are altering stream flow regimes and water quality, in turn, negatively impacting stream channel morphology. The direct and indirect effects associated with road derived runoff under Alternative 1 would continue to result in adverse cumulative effects on each of the drainages.

Alternatives 3 and 4

Direct and Indirect Effects

Generally, less water is used by forest during the stand initiation stage than during all other stages. Not all timber harvests affect water use. Increases in stream flow are measurable during the short-term (10 years) when more than 25 percent of the basal area is removed from a drainage area (Hornbeck and Kochenderfer 2000). Channel morphology can change if water flow in channels changes and/or if there is a change in sediment delivery to streams. As discussed previously, with implementation of Forest Plan standards and guidelines, mitigation measures, and design features, proposed activities are not of a magnitude to change stream flow.

Implementation of either one of the action alternatives would reduce the level of hydrologic connectivity, which exists between the existing road system and project area streams, and should result in a positive CE in both subwatersheds. It is assumed that the benefit of new road construction on existing corridors and decommissioning various road segments would outweigh the limited negative affects posed by proposed road construction (new corridors) and/or harvest activities.

Additionally, implementation of either one of the action alternatives would result in direct improvements to stream channel morphology within the two subwatersheds. There is a forest-wide management objective for perennial streams to provide habitat complexity, channel stability, and pool formation in cold-water streams by managing for the recruitment and long-term maintenance of 75 to 380 pieces of in-stream large woody material per stream mile. Based on visual observations, streams in the BCPA are not meeting this objective. Additionally, several sections of streams have sparse riparian vegetation that would benefit from plantings.

The wildlife treatments proposed in the two action alternatives are identical (Table 4) and were designed to improve aquatic habitat and channel stability within the BCPA. Sections of West Branch Millstone Creek, Brush Creek, Dry Run, Laurel Run, Log Run, and Winlack Run are lacking large coarse woody debris (CWD), aquatic habitat diversity, or vegetative cover to provide shade from solar radiation. The proposed treatments are designed to improve in-stream conditions in these areas by directionally felling trees into the streams and/or planting woody vegetation along the stream banks.

Providing CWD is being proposed on approximately 8.0 miles of West Branch Millstone Creek, Brush Creek, Dry Run, Laurel Run and Winlack Run. In each of the areas, 75 to 200 trees per mile would be directionally felled into streams. These treatments would increase the occurrence of CWD to meet Forest Plan objectives and improve aquatic habitat for the entire aquatic community. In addition, the placement of CWD into streams would provide a short-term benefit of trapping sediment and a long-term benefit to stream energy dissipation.

Riparian vegetation plantings (plantings) are proposed on the headwater sections of West Branch Millstone Creek, McCray Run and Log Run to augment the sparse riparian vegetation present in two large openings. Approximately 3.6 miles of stream would be evaluated for possible treatment. Plantings along stream banks in each of these open areas would provide for additional bank stability and shading from solar radiation, in turn having a beneficial effect on the protected water use of aquatic life.

A variety of aquatic species would benefit from these treatments including Gilt darters and Mountain Brook lamprey, which have been collected within the BCPA from upper Millstone

Creek and West Branch Millstone Creek. Both species are classified as threatened by the Commonwealth of Pennsylvania (PA DEP 2005a) and are included on the RFSS list.

Cumulative Effects
There are no previously approved timber harvest activities within the BCPA. Future FS timber harvests are not expected to have adverse effects on water quality as detailed analysis would be completed; impacts would be mitigated; and streams would be adequately buffered.

In addition, it is reasonable to assume that oil and gas development will continue across the BCPA. New roads and well pads will be constructed near streams and the volume of impermeable area will increase throughout the BCPA. Private timber activities in the sub-watershed are also likely within the next 10 years and could have a negative cumulative effect on stream channel morphology if large portions of a sub-watershed are harvested, streamside areas are harvested, and/or roads are constructed near streams. However, the Forest Service owns a majority of the surface rights in both subwatersheds: 98.5 percent in East Branch Millstone Creek and 59.0 percent in West Branch Millstone Creek. As a result, it is unlikely that private vegetation management activities would have a substantial impact on either drainage. The mineral rights within these drainages are predominately private. It is therefore reasonable to assume that oil and gas development across the analysis area would continue and could result in additional impacts to water quality and stream channel morphology as new roads and well pads are constructed.

Consistency with Commonwealth and Forest Plan Standards and Guidelines
The Commonwealth's anti-degradation policy requires that at a minimum, existing water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Two streams (headwaters of West Branch Millstone Creek and headwaters of East Branch Millstone Creek) within the cumulative effects areas are not listed as "water quality limited" by the Pennsylvania DEP as of the latest 303(d) list (PA DEP 2006). The impaired sections of these streams are outside the BCPA. In addition, these sections are located upstream so activities proposed in this project would not impact the impaired reaches. Stream channels identified in this analysis are in a stable equilibrium but may not fully support the designated protected use of "aquatic life." Currently, the Forest Plan direction to "provide habitat complexity, channel stability, and pool formation in cold-water streams by managing for recruitment of large woody debris" may not be met in many streams due to the absence of instream large woody debris. Directionally felling trees into streams as proposed in this project would help to achieve progress toward meeting this desired future condition.

All of the proposed action alternatives would protect and maintain the existing uses of streams in the cumulative effects analysis areas. Therefore, the action alternatives would meet the intent of the anti-degradation policy, Commonwealth water quality standards, and Forest Plan standards and guidelines for water resources.

Wetlands

Alternative 1: No Action

Direct and Indirect Effects
No previously approved activities are within 100 feet of a nationally inventoried wetland (NWI). Consequently, there are no direct or indirect effects to inventoried wetlands associated with Alternative 1.

Alternatives 3 and 4

Direct and Indirect Effects

There are two stands proposed for treatment (661088 and 659016) that lie approximately 150 feet from different inventoried wetlands associated with tributary streams to the West Branch Millstone Creek. The first stand would receive a thinning treatment under Alternative 3 and is dropped from Alternative 4. The second stand would receive a shelterwood seed cut followed by a shelterwood removal cut under both alternatives. Implementation of these proposed treatments is expected to have little or no effect on the soil or hydrologic resources of the area; therefore, no potential effects on these wetlands are anticipated from these activities.

Wildlife habitat improvement treatments are proposed in stand 659012, which includes activities within an inventoried wetland. Fruit tree pruning and release and aspen regeneration are being proposed. These activities involve minimal soil disturbance and therefore, no direct or indirect effects to wetlands are expected from these activities.

Spring seeps and vernal pools will be protected through design features and mitigations measures listed in section 2.1.4. These mitigations are consistent with the Department of Conservation and Natural Resources Forest Management Plan (2003) and exceed the Pennsylvania Department of Environmental Protections BMPs (PA DEP 2005a; PA DEP 2005b). Therefore, no direct or indirect effects to spring seeps or vernal pools are expected from implementation of the proposed treatments.

Cumulative Effects

There are no known inventoried wetlands within the private lands within the CE area. When considering wetlands occurring on ANF lands, the Forest Plan stipulates that wetland protection is a priority and encroachment is only to be considered if there are no alternatives; therefore, it can be assumed that reasonably foreseeable future Forest Service activities will not reduce wetland acres. Also, it is assumed that the quality of these wetlands will be retained through proper resource planning and avoidance of the wetlands, spring seeps, and vernal pools when implementing stand treatments. Therefore, no cumulative effects are anticipated to inventoried wetlands, spring seeps, vernal pools, or other wetlands within the CE area.

Monitoring

It is recommended that monitoring occur on at least 10 percent of streams within 100 feet of harvest units for purpose of validating the effectiveness of proposed streamside buffers as filter strips to protect water quality and streamflow regime. This should be scheduled to occur early in the spring, when weather conditions are wet and understory vegetation re-growth has not yet occurred. Monitoring should also occur on at least 10 percent of the road improvements made within 300 feet of streams in the BCPA to ensure they are meeting State BMPs.

4.1.3 Transportation

This section discusses potential direct and indirect effects of the alternatives on the transportation system within the BCPA and the BCRAP area. The analysis includes an assessment of the direct and indirect effects on the transportation system within the BCPA, as well as potential cumulative effects on past, present, and future foreseeable activities on the transportation system within the BCRAP area.

Road Density

Direct and Indirect Effects

Under all alternatives, road densities for forest system road are within the standards and guidelines in the Forest Plan (see Table 11).

Road Management

Direct and Indirect Effects

No road management changes are proposed in any alternative. Table 11 in Chapter 2 shows the percentages for open, restricted, and closed roads by alternative in the BCPA. Both action alternatives help to achieve the Forest Plan goal of 20 percent open, 20 percent restricted, and 60 percent closed. In alternative 3, the overall percentage of open roads decreases. This is due to constructing roads, which would be managed as closed or restricted after completed. Overall, the amount of proposed road construction (new or existing corridor) will not affect the amount of open, restricted, and closed roads within the BCPA significantly.

Unroaded Areas

Direct and Indirect Effects

As shown in Table 11 in Chapter 2, there is no change to the three unroaded areas identified in the Forest Wide Roads Analysis with implementation of Alternatives 1 or 4. Under Alternative 3, all three of the unroaded areas would decrease in size due to new road construction. The McRay Run Unroaded Area (#16) has over one half mile of road construction proposed on the edges of this unroaded area in Alternative 3. When originally evaluated for its potential to provide unroaded recreation opportunities, this unroaded area received an average score (USDA-FS 2003). In Alternative 3, this unroaded area would be reduced in size from approximately 1261 acres to 965 acres; however, unroaded recreation opportunities would continue to be provided in this unroaded area. The Lick Run Unroaded Area (#25) also has over one half mile of road construction proposed within it in Alternative 3. When originally evaluated for its potential to provide unroaded recreation opportunities, this unroaded area received an average score (USDA-FS, 2003). However, proposed changes to size and configuration are expected to reduce its score to below average. Since the road construction extends existing roads that are currently managed as restricted or closed, opportunities for solitude would still be provided. The West Branch Millstone Unroaded Area (#55) proposes less than one quarter mile of new construction within the unroaded area, which would reduce the size of the unroaded area from approximately 601 acres to 506 acres. Since the road construction extends existing roads that are currently managed as restricted or closed, opportunities for solitude would still be provided.

Cumulative Effects

The CE analysis area for the transportation resources is the BCRAP area, which includes the BCPA and transportation proposals, primarily pit development and expansion, outside the BCPA.

Under any of the alternatives, implementation of foreseeable transportation proposals (included in the BCRAP), road densities for forest system roads would remain within Forest Plan standards and guidelines for all MAs within the BCRAP area.

Cumulatively, the Forest Service road system in the BCRAP area falls short of the overall Forest Plan goal of 20 percent open, 20 percent restricted, and 60 percent closed; however, Alternatives 3 and 4 move the BCRAP area towards the Forest Plan goal.

As mentioned above, under alternatives 1 and 4, the size of the unroaded areas in the BCPA would not change, and all three unroaded areas would be reduced in size under alternative 3. Future changes in the size of the unroaded areas could result from OGM development or road construction needs displayed in the BCRAP. At this time, future road construction that may affect unroaded areas is unknown and can not be mapped. Hence, the future shape and acres of the unroaded areas are difficult to predict.

4.1.4 Air Quality

This section describes the direct and indirect effects to air quality, mitigation measures to reduce those consequences and cumulative effects.

Alternative 1: No Action

Direct and Indirect Effects

No activities are proposed and no additional emissions are expected to take place in the BCPA beyond what occurs now. Forest roads will continue to receive periodic maintenance. Vehicle use will continue in the BCPA. These existing emissions are currently contributing to the air quality described in the affected environment as well as the larger.

Alternatives 3 and 4

Direct and Indirect Effects

Under both action alternatives, the BCPA would undergo short-term, small impacts on ambient air quality from exhaust emissions, dispersion of fugitive dust, and pesticide application. Emissions from mechanical equipment (including trucks, skidders, and chainsaws) entering, working in and exiting the project sites would contribute to these impacts. Emissions from this equipment would include nitrogen oxides, volatile organic compounds, and carbon monoxide (CO) from the exhaust of internal-combustion engines. Potential emissions of fugitive dust (particulate matter emissions smaller than 10 and 2.5 microns (PM_{10} and $PM_{2.5}$) could result from the proposed activities that disturb the land and from tailpipe emissions from vehicles. During proposed operations, dust might be generated when dry soil is disturbed during clearing, grading, trenching, backfilling, and moving vehicles. Dust would also be generated by minor wind erosion of the disturbed areas.

Due to the large number of days with precipitation that occur in this area and the low volume of traffic on many unpaved roads, as well as the closed tree canopy over most roads, fugitive dust is not typically a health concern in this area. No health facilities are located in or near the BCPA; therefore, fugitive dust is not considered a problem to any facility. All impacts would be small and short-term, and they would not affect attainment of NAAQS. Localized air quality would not be adverse to personnel involved in application of pesticides nor to people off-site (USDA-FS 1991 a).

About 149 acres of prescribed burning for wildlife habitat improvements and hazardous fuels reduction are proposed in both action alternatives. Implementation of prescribed burning will create pollutants in the form of particulate matter (both PM_{10} and $PM_{2.5}$) and carbon monoxide as a result of burning organic matter. The level of pollutants created from prescribed burning would be short-term and within acceptable limits for a Class II airshed. Smoke from burning operations may be safety concern on several roads (SR 2005, SR 3002, and T327 [FR 130]) within the BCPA; however, these concerns can be mitigated through smoke management.

In both action alternatives, effects to air quality would be short-term and smoke concerns will be mitigated. Prior to prescribe burning of a site, fire behavior calculations would be done as part of the development of a prescribe burn plan. The burn plan will use these calculations along with weather variables to develop a "burn window", where burning objectives and smoke management can be achieved. Signs will be posted during burning operations or access to burning areas will be limited to reduce public exposure to smoke. Human health risks related to exposure to smoke from the proposed burning is anticipated to be minimal when smoke guidelines are in place. No appreciable effects to air quality would result from the proposed prescribed burning activities in the action alternatives.

Cumulative Effects
Because air pollution is regional in nature and has the potential to disperse beyond project boundaries, emissions from mechanical equipment, prescribed fire, and pesticide application must be evaluated in the context of regional pollution loads and current air quality monitoring data. In the vicinity of the BCPA, these air quality control regions are identified as individual counties. For this reason the scope of the air quality analysis will include Elk and Forest counties; the air quality control regions where the BCP is located.

Warm season grasses in the Buzzard Swamp Propagation Area, which lies east of and adjacent to the BCPA, were burned in 2002 (150 acres), 2004 (115 acres), and 2006 (101 acres) and are proposed for continued prescribed burning (50 to 150 acres) annually in the spring for wildlife habitat improvement through 2008. Prescribed burning (up to 90 acres annually in the spring) have been approved for the herbaceous openings in the Upper Millstone drainage, which is north of and adjacent to the BCPA over the next five years. Repeated prescribed burns (every 2-5 years) are necessary to maintain warm season grasses.

Under both action alternatives, prescribed fire could be used more than once to achieve wildlife habitat improvement objectives. These repeated burns are not expected to have a cumulative effect because the impacts are small and short term and would not affect the attainment of NAAQS.

Proposed activities, including timber harvests, road construction, and prescribed burning, in the BCPA are the same type of activities that have occurred within Elk and Forest counties within the past 10 years. Since the area has remained as an attainment area over that time period and longer, the cumulative sum of all temporary, localized impacts would not affect the region's current attainment of NAAQS. Additionally, cumulative impacts with other regional activities, including oil, gas and coal fired plants in the region, would not affect or change the region's current attainment of NAAQS.

4.1.5 Oil, Gas, and Minerals

Coordination of vegetation and OGM management on the ANF has been effectively demonstrated over the past decades. Direct and indirect effects are described below. An effect that is common to all alternatives includes the use of stone and gravel for road construction and maintenance. This material would be obtained from existing pits or developing new pits on the ANF.

Alternative 1: No Action

Direct and Indirect Effects

There would be no additional effects to oil, gas, and mineral resources, except for the possible expansion of existing pits for road maintenance.

Alternatives 3 and 4

Direct and Indirect Effects

Direct and indirect OGM effects would be small, short-term, and local. Minor, indirect impacts on OGM operations could result from increased traffic on the forest roads during the short period that proposed actions would occur. Forest Plan standards and guidelines require the protection of pipelines, power lines, and wells during proposed activities, which would minimize impacts on the OGM infrastructure.

The proposed activities would directly impact mineral resources in the project area. Stone and gravel for proposed road construction and maintenance would be obtained from new and existing pits on the ANF. Use of such stone and gravel would result in minor irretrievable loss of this salable (common variety) mineral resource.

Cumulative Effects

The CE analysis area for OGM resources is the BCPA. The CE analysis area for stone pits is the BCRAP area, which includes all the proposed pit expansion and developments for the road system within the BCPA. The CE area was chosen because the parcels of public and private land within the project boundary share common vegetation types, wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and past historic uses as well as future impacts.

At the current rate of OGM development on the ANF, it is estimated that four new wells per year will be drilled within the BCPA. This will result in approximately 42 new wells, four miles of new access roads, and five acres of pit expansion within the BCPA over the next decade. This level of OGM development would affect only 0.8 percent of the CE area and should not have any substantial impacts. Through continued cooperative efforts and implementation of Forest Plan standards and guidelines, mitigation measures, and design features, no significant cumulative effects to OGM resources are anticipated from proposed and foreseeable future activities.

There are 15 potentially useable/expandable pits in the BCRAP area. Pit expansion is proposed for 6 pits in Alternative 3 and 4 pits in Alternative 4. Two sites have been identified for future pit development. Both of which could be developed in Alternative 3 and one (off FR 592) in Alternative 4. Including potential OGM development, proposed pit expansion and development within the BCRAP area is projected to be about 20-30 acres over the next 20 years, which represents about 0.16 percent of the BCRAP area. Use of such stone and gravel would result in minor irretrievable loss of this salable mineral resource. However, there is concern about the quality, quantity, and access to pit run into the future. Consequently, alternate (off-forest) sources for stone and gravel may be needed or investigated in the future. Limestone surfacing will be procured from private sources outside of the ANF.

4.2 Biological Environment

The direct, indirect, and cumulative effects to vegetation, non-native invasive plants (NNIS), and wildlife are summarized in the following sections.

The temporal boundaries for the cumulative effects (CE) analysis of all biological resources are from 1996 to 2026 (10 years in the past and 20 years into the future). This time period provides an overall view of the incremental impact of vegetation management and OGM activities in combination with current project proposals. The spatial boundaries for the biological resources are described and a rationale provided by resource.

4.2.1 Vegetation

This section discusses potential direct and indirect effects of the alternatives on forest vegetation within the BCPA. The analysis includes an assessment of the direct and indirect effects on the vegetation within the BCPA, as well as potential cumulative effects on past, present, and future foreseeable activities on the composition and health of the forest vegetation across the landscape.

The rationale for applying silvicultural treatments on the ANF is based largely on research conducted on the Allegheny Plateau by the Northeastern Research Station. Much of this research is documented in *Prescribing Silvicultural Treatments in Hardwoods Stands of the Alleghenies* (Revised) (Marquis and others 1992) and *Quantitative Silviculture for Hardwood Forests in the Alleghenies* (Marquis 1994). When silvicultural treatments are applied in stands that meet specified criteria, predictable results or outcomes can be achieved. These predictable results underlie the following discussion on the direct and indirect effects of the silvicultural treatments.

Alternative 1: No Action

Direct and Indirect Effects

Since no harvest would occur under this alternative, any changes in vegetation would be the result of natural stand development or disturbance processes. No new early-successional habitat would be created except for that caused by natural processes or potential future management in another project. As stands mature, the amount of late-successional habitat would increase from less than 1 percent to 11 percent over the next two decades within the BCPA. It is estimated that interfering vegetation would be present over most of the project area within 20 years, preventing many seeds from germinating and becoming established. Shade tolerant trees and shrubs, such as American beech, black birch, and striped maple, grasses, and ferns would probably continue to dominate the understory over time. Horizontal diversity, or patchiness across the landscape, would decline, unless natural disturbances and/or future management create new age classes. Beech, birch, and striped maple would grow into the midstory and contribute towards vertical diversity (canopy depth).

Due to a legacy of selective browsing by deer on the ANF, advance regeneration is usually absent and lacks diversity of species (Tilghman 1989; Jones and others 1993; de Calesta 1994; Redding 1995; de Calesta 1998; Horsley and others 2003). Considering the low palability of beech for deer, it is anticipated that many areas would regenerate to beech without any intervention. When black birch becomes established in quantity, it can withstand moderate to high deer browing. Black birch is also tolerant of shade and grows rapidly in partial or full sunlight.

Alternative 3

Direct and Indirect Effects

This alternative would create approximately 702 acres of early-successional habitat, the largest amount of any of the alternatives. This alternative proposes the following reforestation treatments: 732 acres of site preparation, 957 acres of herbicide application, 350 acres of planting, 241 acres of fertilization, 84 acres of tree shelters, and 662 acres of fence installation.

Reforestation treatments would control competing vegetation long enough to allow tree seedlings to become established and exclude deer browsing impacts. Where fencing is proposed in treated stands, the understory species diversity will improve. The amount of late-successional habitat would increase from less than 1 percent to 11 percent over the next two decades with this alternative too.

Alternative 4

Direct and Indirect Effects

Alternative 4 excludes harvest in areas that would need a new road to access the stands and minimizes fragmentation. This alternative also utilizes uneven-aged management and commercial thinning in the project area north of SR 2005 and SR 3002. This alternative reduces the acres of reforestation treatments compared with Alternative 3. The amount of reforestation activity in this alternative is as follows: 365 acres of site preparation, 574 acres of herbicide application, 231 acres of planting, 144 acres of fertilization, 73 acres of tree shelters, and 358 acres of fence installation.

By proposing less harvesting than Alternative 3, this alternative would create a smaller amount of early-successional habitat (309 acres). This alternative would also have the same amount of late-successional habitat as the other alternatives in 20 years. Reforestation treatments would control competing vegetation long enough to allow tree seedlings to become established, improving the diversity of the understory species in treated stands.

Cumulative Effects

Cumulative effects are impacts that result from the incremental effects of the proposed action when added to past, present, and reasonably foreseeable future actions, regardless of land ownership. A timeframe of 10 years (1997-2006) into the past was used as it would incorporate completed and ongoing activities from past projects. A timeframe of 20 years (2007-2026) into the future was used to allow for all proposed and reasonably foreseeable related future activities to be completed and resulting vegetation changes to occur. The vegetation cumulative effects (CE) analysis area for this project encompasses the BCPA. Enlarging the geographic scope to include National Forest lands outside the CE analysis area could dilute the potential cumulative effects because adjoining areas have similar (MA 3.0) or less management intensity levels (MA 6.1, and private lands) than those lands within the CE area. The cumulative effects on vegetation are discussed in terms of the cumulative effects of treatment amounts, age class (early-successional and late-successional stages), and understory and midstory vegetation.

There are 99 acres of private land within the BCPA or CE area. Based on estimates from aerial photographic interpretation, these properties are a mix of mature hardwood forest (97 acres) and a variety of openings (2 acres of agricultural fields, access roads, and residences or recreational camps). Commercial timber management has not been a high priority of these landowners.

Cumulative Effects from Harvest Treatments

No projects have been done it this project area within the last 10 years. To meet Forest Plan goals and objectives for MA 3.0 in the second decade (2017 to 2026), additional silvicultural treatments are expected to occur on 9 percent (or 931 acres) of the BCPA. This would include final harvests and associated reforestation treatments.

Table 23 summarizes treatments that have occurred or are anticipated to occur within the CE area. The projected total even-aged final harvest activity comes from this project and potential

future harvests from private and NFS lands. The projected range of final harvest is between 9 percent and 16percent for all of the alternatives for the 30 year CE period. Therefore, a large portion (91 to 84 percent) of the analysis area is not anticipated to be regenerated during the CVE analysis time period.

Table 23. Cumulative Vegetation Totals by Treatment for Cumulative Effects (CE) Analysis Area (10,347 acres)

Treatment	Past Treatments 1996-2005 Acres/Percent of CE area	Cumulative Totals (past, present, future) Acres/Percent of CE area		
		Alt 1	Alt 3	Alt 4
Shelterwood Seed/Removal Cut	0	931 (9%)	1633 (16%)	1240 (12%)
Intermediate Thinning	0	931 (9%)	1468 (14%)	1288 (12%)
Salvage Only	0	0	2 (0%)	2 (0%)
Group Selection	0	0	0	54 (1%)
Herbicide	0	931 (9%)	1888 (18%)	1505 (15%)
Fencing/Tree Shelters	0	931 (9%)	1593 (15%)	1289 (12%)
Site Preparation	0	931 (9%)	1663 (16%)	1296 (13%)
Fertilization	0	103 (1%)	344 (3%)	247 (2%)
Planting	0	103 (1%)	453 (4%)	334 (3%)
Release	0	955 (9%)	1874 (18%)	1492 (14%)

Cumulative Effects for Early Age Classes and Late Successional Forest/OldGrowth
Table 24 displays the present age class distribution found within the CE area and forecasts the distribution that would occur in the next twenty years (by 2026) under the different alternatives. There are minor differences in age class distribution anticipated between the alternatives. Age class changes in Alternative 3 and 4 are a result of the treatments proposed in this and future projects. Changes in Alternative 1 are a result of the treatments proposed in future projects on private and NFS lands.

Table 24. Age Class Distribution for CE Analysis Area

Age Class	Present Condition Year 2006	Alt 1 Year 2026	Alt 3 Year 2026	Alt 4 Year 2026
Openings	7%	7%	7%	7%
0-10 years	0%	9%	9%	9%
11-20 years	6%	0%	7%	3%
21-50 years	5%	8%	8%	8%
51-110 years	81%	64%	57%	61%
111+ years	0%	11%	11%	11%

In Alternatives 3 and 4, 702 (7 percent) and 309 (3 percent) acres, respectively, of 0-10 year age class would be created in the next decade within the CE area. This compares with an estimated 9 percent DFC for MA 3 in the 0-10 year age class and a composite of 18 percent in 0-20 year age class. The cumulative effects of Alternative 3 and 4, in combination with other actions, are predicted to increase the early-successional habitat towards the calculated Forest Plan DFC for MA 3. In all alternatives, 9 percent of the CE will be 0 to 10 years old by 2026.

In all alternatives, late successional forest will increase from less than 1 percent to 11 percent (this assumes the 9 percent in the 0-10 year age class all comes from the 111+ age class in all alternatives) of the CE area by 2026. In the long term, areas managed for late-successional forest and old growth will continue to be influenced by the legacy of deer browsing impacts, introduced and native forest insects, and natural disturbances over time. Mature (>50 years old) forest habitat will be at least 68 percent in all alternatives. Regardless of the alternative, there is a similar distribution in age classes in the mature and late-successional forest.

Cumulative Effects to Understory and Mid-Story Vegetation

The principle effects of past and proposed vegetative management activity are most easily seen in changes related to species diversity and structure. Diversity is defined as the distribution and abundance of different plant and animal communities and species within an area. Structure is defined in terms of horizontal as well as vertical vegetative components, such as herbaceous, understory, midstory, and overstory layers (vertical) as well as how these layers are distributed across the landscape (horizontal). The following summary of anticipated cumulative effects takes into account what has happened and what can reasonably be expected to take place in the CE area.

Many of the regeneration prescriptions include the application of herbicide. The primary objective of its use is to create conditions favorable for seedling development and growth. This will increase seedlings height so final harvests can occur and stands will have successfully regenerated. Without the use of herbicides and other reforestation treatments, beech, birch, striped maple, grasses, and ferns would continue to dominate the understory within the CE area. These areas will likely be dominated by beech, striped maple, and birch, with pockets of other tree species developing where they are protected from deer browsing. Current encroachment of fern, grass, striped maple and beech brush in the understory would inhibit growth of seedlings and continue to spread where canopy gaps occur. If deer densities return to a high level, there could be a decrease in plant species in the long term (> 50 years).

Within the past 10 years, no herbicides have been applied in the CE area. No herbicide application is proposed in alternative 1. In both action alternatives, the diversity of the understory would be increased wherever herbicides, site preparation, fertilization, fencing, and/or other reforestation treatments are implemented.

Nine hundred eighty-six (986) acres (Alternative 3) and 603 acres (Alternative 4) of herbicide application are proposed to occur through implementation of this project. Alternatives 3 and 4 would encourage more horizontal structure. Even-aged regeneration activities in Alternatives 3 and 4 would create early-successional habitat that would otherwise be lacking within the project area, except for what might be created through larger scale natural disturbances. The herbicide application proposed in Alternatives 3 and 4 would reduce the amount of fern, grass, striped maple, and beech. After herbicide treatment, a fuller range of plant communities would be expected to occupy the understory (Horsley and others 1994). These would include tree species

as well as shrubs, forbs, and wildflowers that are presently absent, providing seed sources are nearby. Fencing in both alternatives would contribute to maintaining plant diversity within specific stands since deer browsing is discouraged, which is a leading factor in the loss of diversity.

4.2.2 Non-Native Invasive Species (NNIS)

Three main management concerns are associated with NNIS: (1) increase vehicle traffic and human activity may introduce new NNIS, (2) ground disturbance during road construction, timber harvesting, and reforestation activities creates favorable conditions for early-successional NNIS, and (3) existing NNIS may spread along trails and roadways. Direct effects of the project would include distribution of viable seeds and other reproductive plants into new areas. Indirect effects would include changes in habitat conditions that would facilitate the spread of NNIS.

Alternative 1: No Action

Direct and Indirect Effects

Under Alternative 1, no human disturbances to the forested habitats are proposed. However, small canopy gaps are expected to occur over time due to natural tree mortality. No significant effects are expected under this alternative due to the small and localized nature of the anticipated canopy gaps and the scattered nature of the NNIS invasions within the BCPA.

Alternatives 3 and 4

Direct and Indirect Effects

As a result of proposed road construction, timber harvesting, and reforestation activities in the action alternatives, fragmentation would increase. In response to fragmentation, the abundance of NNIS in the landscape and their average proximity to the remaining forest fragments may increase (Brothers and Spingarn 1992). Fragmentation causes micro-environmental changes at forest edges that could provide entry points for NNIS (Brothers and Spingarn 1992). Mitigation measures would be implemented to avoid and minimize the introduction, propagation, and spread of NNIS.

Cumulative Effects

The CE analysis area for NNIS is the BCPA. The CE area was chosen because the parcels of public and private land within the project boundary share common vegetation types, wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and past historic uses as well as future impacts.

A direct effect of oil and gas well development on NNIS is the permanent alteration of habitat, mainly the loss of forest habitat and creation of opening and edge habitat that could provide suitable habitat for most NNIS. However, considering the size of the BCPA (CE area) and based on the level of activity that is projected, OGM development would directly affect only 0.8 percent of the CE area and not have a substantial impact on NNIS. In addition, areas of disturbance (such as well sites) are typically re-vegetated or stabilized readily reducing the potential for establishment of NNIS.

No substantial cumulative effects related to the introduction or spread of NNIS are anticipated under either action alternative because:

- There are presently no documented large infestations of NNIS in the BCPA or the CE analysis area and surveys show when infestations do occur, they are generally small, low density, and scattered.
- The openings created by harvest treatments are temporary in nature minimizing long-term impacts and the possible spread of shade intolerant NNIS.
- Implementation of the mitigation measures will minimize or reduce potential seed dispersal from existing seed sources of NNIS from management activities.
- Presently, approximately 87 percent of the BCPA consists of forested stands >20 years of age and has a relatively low potential for the spread or introduction of most shade intolerant NNIS.
- Road construction and maintenance, on an as-needed basis, would occur across the BCPA (depending on safety issues and funding) and is expected to have minimal effect on NNIS.
- Equipment cleaning is included for several forest vegetation management activities. Appropriate cleaning of "off road equipment" will lessen the potential spread of NNIS away from road corridors into the forest.
- All applicable design features and mitigation measures for other resources will be followed during timber harvesting and reforestation activities.

4.2.3 Wildlife

The effects analysis was based on review of literature and scientific knowledge concerning the effects of timber harvest and road construction on habitat structure, mast production, and disturbance of wildlife. The analysis follows the three-tiered strategy outlined in Chapter 3, Section 3.2.3 to examine potential impacts on a) wildlife habitat at the landscape scale (coarse filter approach), b) MIS and their habitats (project area filter), and c) federally-threatened and endangered species and RFSS (fine filter approach). Landscape-scale concerns such as cumulative effects or impacts on wildlife and fragmentation of wildlife habitats are discussed primarily in the context of the coarse filter approach.

Course Filter Approach: Effects on the Composition and Structure of Wildlife Habitats

Direct and Indirect Effects

Wildlife habitats in forested environments are dynamic and typically change over time and space in response to both small and large scale disturbances, as well as natural processes of succession and stand development. Over 150 species of animals are known to use the various age classes of wildlife habitats present on the ANF (see Table 17). Although forest management activities would influence the relative abundance and composition of fauna communities in particular habitats, the greatest overall diversity of wildlife is generally associated with early-successional and mature forest types. At a landscape scale, this suggests that high levels of species richness can be maintained by providing for a variety of age classes and forest habitat types across the BCPA.

The stand-level effects of even-aged management on wildlife are often species-specific and vary greatly over both time and space. For example, during natural succession in northern hardwood forest types, species diversity is typically high in naturally regenerating stands due to the rapid

growth of the shrub and herbaceous layers following disturbances (DeGraaf and others 1992). Diversity then declines through intermediate stages of stand development (pole timber 21 to 50 years old) and increases to maximum values during later-successional stages (mature sawtimber and old growth).

For certain groups of bird, amphibian, and reptile species that are highly sensitive to changes in habitat structure, overstory removals, which favor early-successional species, could have short-term adverse effects. These species that depend on mature forest may be displaced for up to 50 years or until mature forest conditions are re-established. However, patterns of bird abundance following stand regeneration events are generally short-lived (less than 10 to 15 years) and fluctuate in response to changes in the vegetative community over time (see Table 25). Bird species are more sensitive to silvicultural treatment than any other taxonomic groups (DeGraaf and others 1992). Breeding bird densities in regenerating stands in managed forests are typically greater than densities in mid-successional (intermediate age pole timber) stands and approach or exceed densities in mature stands (Thompson and others 1993).

Table 25. Songbird Patterns of Habitat Use Following Regeneration Harvests on the ANF

Species	Years Following Regeneration Harvests[1]		
	First Appearance	Becomes Common	Declining Abundance
Eastern bluebird	1	1	2
Northern flicker	1	1	7-10
Winter wren	1	1	2
Swainson's thrush	2	4	15
Chestnut-sided warbler	2	4	10
Mourning warbler	2	5	7-10
Common yellowthroat	2	6	10
American goldfinch	2	6	7-10
Cedar waxwing	2	4	7-10
Veery	3	6 +	n/a[3]
Black and white warbler	3	4 +	15
Rose-breasted grosbeak	3	15 +	n/a[3]
Canada warbler	5	15 +	n/a[3]
Ruffed grouse	10	15 +	n/a[3]
Wood thrush	10	15 +	n/a[3]
Ovenbird	5 -10[2]	15 +	n/a[3]
Black-throated blue warbler	5 – 10[2]	15 +	n/a[3]
Black-throated green warbler	5 - 10[2]	15 +	n/a[3]

Notes:

1. Based on northern hardwoods forest types Although most of the regeneration harvests on the ANF are done in stands defined as the Allegheny Hardwoods type, bird species utilization of seedling/sapling stands is a primarily a function of stand structure and stem densities and not the presence or absence of certain tree species.
2. Breeding bird data on the ANF indicates these species first appear 5-10 years after the stand receives a removal cut.
3. Present in the stand throughout remainder of rotation.

Similarly, timber harvesting in Pennsylvania has been found to temporarily increase the abundance and diversity of snakes and decrease the abundance of salamander species (Ross and others 2000). These patterns appear to be related primarily to changes in microclimatic conditions resulting from removal of the forest overstory and the retention of reserve trees and coarse woody material in harvested stands. The environmental effects of even-aged harvests may influence habitat use by sensitive plethodontid salamanders for distances of 25 to 30 meters into the surrounding un-harvested forest matrix (Demaynadier and Hunter 1998). However, species such as red spotted newts and the American toad appear to be more tolerant of recently harvested conditions. Ross and others (2000) found frogs and toads to be less sensitive to harvesting

intensity; the presence of these species was generally correlated with the presence of temporary and permanent pools of water within stands.

Table 26. Current and Projected Distribution of Wildlife Habitat by Alternative (2006-2016)

Habitat Type	Current Condition[1]	Alt 1	Alt 3	Alt 4
Seedling (0-10 years)	0%	0%	7%	3%
Sapling (11-20 years)	6%	0%	0%	0%
Pole (21- 50 years)[3]	5%	9%	9%	9%
Sawtimber (51-110 years)[3]	81%	81%	74%	78%
Over mature (111+ years)[3]	0.3%	3%	3%	3%
Permanent openings	7%	7%	7%	7%
Conifer cover[2]	6%	6%	6%	6%

1. Expressed as a percentage of the 10,248 acres of federal land in the project boundary.
2. Classified conifer stands have a conifer component greater than 50 percent. An additional 20 percent of the project area supports understory or inclusions of hemlock. These inclusions are expected to be maintained through the life of the project (by 2016) regardless of the alternative selected.
3. These age classes include mast producing tree species >35 years old, such as oak, beech, black cherry, birch and maples. This table displays percentages based on the assumption that all overstory removals will be taken from these age classes.

Environmental Consequences Common to All Action Alternatives

Both action alternatives involve thinning and final (shelterwood and overstory removal) harvests. Alternative 4 includes uneven-aged harvests. Species and feature specific effects due to these harvest practices would be the same in both action alternatives. Alternative 4 includes uneven-aged harvest

Thinning and uneven-aged harvests would remove lower quality trees and release healthy trees, including mast producing trees such as oaks and cucumber. Wildlife species requiring closed canopy forest may be adversely affected by these harvests in the short term, as these harvests would create gaps in the forest canopy up to three acres in size in group selection harvests. However, these gaps may allow understory vegetation to flourish from the temporary increase of sunlight reaching the forest floor. This vegetation would provide increased structural diversity that could attract songbirds such as the hooded warbler and nesting wild turkeys. Avian predators that prefer a more open understory may have reduced hunting success in the dense understory vegetation. Some mast producing trees would be removed, but residual mast producing species of trees and shrubs would experience less competition and probably would produce more mast.

The effects from thinning and uneven-aged harvests to tree-nesting species or species requiring cavities would be minimized by standards and guidelines in the Forest Plan that call for the retention of snags and den trees in cutting units (UDSA-FS 1986a, p 4-32).

Salamanders could experience local population declines in the regeneration harvest units proposed and possibly in thinned stands. In final harvests where sunlight reaches the soil, the surface is hardened and prevents salamanders from reaching the surface to feed. Effects would be reduced by leaving tree tops and other slash scattered through harvest units. Pauley (1997, *in* USDA-FS 2006b, p 3-86) has noted that in West Virginia, red-backed salamanders would return to pre-clearcut populations within 22 years. Populations of mountain dusky salamanders would return and would be abundant, but would not equal pre-clearcut populations as quickly as the red-backed salamanders.

The skid roads needed to remove timber from the conventional harvest units may provide travel lanes for some species, such as deer and bear. Skid roads may temporarily isolate some small species such as salamanders that are associated with leaf litter and other forest floor organic matter, since their movements may be restricted by areas of bare soil.

Both action alternatives include several miles of road construction and maintenance. Road construction would result in the removal of linear strips of trees, other woody and herbaceous vegetation, topsoil, leaf litter and other organic material used by wildlife. Soil and ground disturbance from road construction could directly affect ground-nesting species by destroying ground nests and burrows, with possible loss of adults and young (salamanders, rabbits, mice, chipmunks, and ground-nesting birds such as juncos and ovenbirds). Soil compaction on roads, skid roads, and log landings would be detrimental for burrowing animals on those specific sites, but adjacent to the roads and landings would be largely unaffected. By creating new edge habitat, road construction may benefit species like deer and eastern towhees.

In general, the maintenance of existing roads would have minor effects on wildlife. Road maintenance would result in the removal of tree limbs, vines, brush, and other vegetation that have encroached onto the roadways in the last several years. Maintenance may also require additional surfacing material to be applied such as pit stone or limestone. The reestablishment of the road corridor may benefit certain bat species that forage in linear openings. Species such as deer, turkeys, grouse, cottontails, and songbirds would lose the clover and other preferred plant species that presently occur on some of the roadways. However, these resources should still be available to a lesser extent on the roadsides and in other open areas. Roads that are prescribed for decommissioning will also provide this feature of linear herbaceous openings. Log landings would provide temporary herbaceous cover after the period of use, since they would be revegetated after use.

Most of the species in the generalist associations, such as deer, are considered to be tolerant of human disturbance to some degree. However, some species such as black bear and wild turkey are believed to be sensitive to disturbance, particularly during critical life stages like nesting or denning and brood rearing or raising young. Short-term direct and indirect disturbance to wildlife may occur during project implementation from (1) physical harm or mortality of individual animals from equipment use, tree felling and skidding; (2) disturbance or destruction of nesting and roosting sites, cover vegetation, or food sources; (3) noise disturbance from equipment use and vehicle traffic; (4) visual disturbance from increased human activities in the area; and (5) soil disturbance and compaction during road construction and skidding. Some animals may become roadkill victims due to the increase in log trucks and other vehicle traffic in the BCPA during project activities.

Long-term disturbance could occur after project completion if new roads or road improvements facilitate human access into the area. Besides the above mentioned effects, increased access could increase the chance of poaching and collecting of a variety of species such as turtles. Sources of additional disturbance due to improved access would also include increased foot travel, bicycle travel, and unauthorized motor vehicle use (i.e. ATV's). Noise from equipment and human activity could cause some species, such as bears, bobcats, and turkeys, to change their normal activity patterns to avoid some locations.

The wildlife habitat improvements prescribed for the BCPA will generally have a beneficial long-term effect for a variety of wildlife species. Some of the proposed activities will create direct and indirect effects during implementation. Temporary disturbance and noise from machinery would occur during implementation of aspen regeneration, which would include felling aspen, herbicide application, mowing, prescribed burning, and installing a water control structure in an existing pond. The effects from machinery and increased human disturbances are described above. Prescribed burning could pose a threat to species that are less mobile, such as amphibians, if they are burned over or if they enter the areas before they are adequately cooled. However, prescribed burns are proposed to occur from October 15 to April 15 so it is very likely that the majority of these species will not have emerged. The effects of smoke are expected to be negligible and are analyzed in Section 4.1.4-Air Quality.

Effects by Alternatives

Table 26 presents the short-term (2006 to 2016) projected landscape level changes in wildlife habitat resulting from implementation of the different alternatives. In general, the effects of wildlife habitat are proportional to the amount of final harvests proposed in each alternative and the subsequent age class distributions.

Alternative 1: No Action

Direct and Indirect Effects

Under Alternative 1, the amount of early-successional habitat would decrease within the BCPA over the next 10-year period; whereas under Alternatives 3 and 4, this type of habitat would increase (see Table 26). Stands not affected by catastrophic mortality and forest decline would continue to develop into mature sawtimber and late-successional age-classes under Alternative 1. These changes would tend to favor species that use late-successional stages of forest habitat. Therefore, species that use early-successional habitats would tend to decrease in abundance across the project area under Alternative 1. On the reforestation-only portions of the project, the seedling/sapling age stands would progress toward young pole-size hardwood habitat. As a result, species that use early-successional habitats would tend to decrease in abundance across the project area. Availability of den trees for bears may increase as trees grow larger and become more susceptible to diseases and injuries that create hollows. These trees also would be more likely to fall over creating tip ups and root wads that are known to be used by bears also. The amount of wildlife habitat in conifer cover and permanent openings would remain the same where conifer is retained and slightly increase where conifers are planted.

No mast producing vegetation would be removed; however, no mast trees would be regenerated or released for future sustainable production. Mast producing shrubs would remain in the understory but would not produce as much mast as in a managed forest where light conditions in the understory would be increased by management actions such as thinning. Natural breaks in the canopy due to overstory tree mortality would allow additional sunlight to reach mast producing shrubs.

Affects on wildlife from human activities in the project area would remain static. Access and use of the area would remain at current levels with no expectation of any increased use of the area.

Alternatives 3 and 4

Direct and Indirect Effects

Implementation of overstory removals and shelterwood removals in Alternatives 3 and 4 would create additional regenerating forest habitat (0-10 year age class) on 7 percent to 3 percent (respectively) of the BCPA. For Alternatives 3 and 4, increases in the abundance of species that use early-successional habitats could be expected with a lesser amount of change observed under Alternative 3; therefore, local decreases in abundance and habitat use for species that prefer mature and late-successional forests could be expected in harvested stands over the next 10 years. Adequate refuges should still exist either within or in close proximity to the harvested areas to allow recolonization as the regenerating stands mature over the next 50 years.

Forest Plan standards and guidelines, mitigation measures, and design features (listed in Chapter 2) for protecting rare or sensitive wildlife species and their habitat (such as rock outcrops, spring/seep complexes, den sites, and shrub and conifer inclusions) would be implemented under each action alternative. An adequate supply of snags and potential den trees would be retained in treated areas to provide continued habitat for those species that nest in cavities, forage or nest on or in dead and dying trees, and rely on coarse woody material on the forest floor.

The regeneration harvest would result in abundant ground and shrub vegetation available for browse, nesting, and cover. During the initial 10 years following harvesting, these sites would provide a varied food base of blackberry, forbs, woody vegetation, and grasses for a variety of animals, such as bears, turkeys, grouse, foxes, raccoons, and deer.

Overstory removals would retain some residual trees, according to Forest Plan standards and guidelines for all management areas. The residual trees remaining after the timber harvest likely would experience an increase in mast production, but the overall mast production of the affected stands would be reduced in the short term.

Under Alternatives 3 and 4, herbicide applications are proposed on 986 and 603 acres or nine percent and six percent of the project respectively. The effects of herbicide application (glyphosate and sulfometuron methyl) on wildlife species on the ANF have been fully evaluated in the Understory Vegetation Management FEIS (USDA-FS 1991a). No significant wildlife risk has been identified from exposure or bioaccumulation of these herbicides. In a study conducted to assess the impacts of herbicides application and shelterwood cutting in Allegheny hardwoods, overall mammal diversity decreased from herbicide treatment, primarily due to the effects on shrews (Stoleson and others undated). Although bird diversity was not affected by the herbicide treatment and shelterwood cutting, the abundance of several mid-story or shrub-inhabiting Neotropical migrants declined (Stoleson and others undated). Abundance of red-backed salamanders was not affected by herbicide treatment; however, the species declined after shelterwood cut. Based on the above study, similar effects on wildlife can be anticipated under Alternative 3 and 4.

Manual control of understory vegetation (site preparation and release cuts) would result in short-term alteration of wildlife habitats under Alternatives 3 and 4 to promote the development of a new age class of forest regeneration. The effects of cutting undesirable competing woody vegetation would temporarily reduce the vertical and horizontal structure of these vegetative layers in the treated stands. However, this effect would generally last only a few years and not

have a significant impact on wildlife, since the treatments would focus on a few species (primarily striped maple, birch and American beech). Other valuable mast-producing shrubs and small trees, such as serviceberry, witch-hazel, viburnums, ironwood, dogwood, and blackberries, would be retained in the treatment areas for wildlife.

- In addition, site preparation and non-commercial release cuts would be conducted outside the period of April 1 to June 30, to avoid possible impacts to nesting songbirds (see Chapter 2).

The primary impacts to understory vegetation from the implementation of these treatments proposed in Alternatives 3 and 4 would be a short-term alteration of habitat (2 to 3 years) as the densities of ferns, grasses, striped maple, and beech brush are reduced in the treated stands. However, the long-term effect of herbicide treatments would be an increase in structural diversity, vegetative composition and age classes, and wildlife habitat function and use in the project. Forest-wide standards and guidelines, mitigation measures, and design features to protect water quality and sensitive resources (seeps, springs, wetland inclusions, conifer inclusions, and any unique plant communities) would be implemented during the herbicide applications to minimize the potential for any adverse impacts to wildlife resources or habitats.

Activities proposed under Alternatives 3 and 4 to promote regeneration, such as fence construction will have no adverse effects on wildlife habitat. Although fencing would temporarily exclude the use of a limited amount of habitat (662 to 358 acres or about six percent and three percent of the BCPA) by white-tailed deer and to a lesser degree other large mammals, such as black bear, the long-term effect would be to promote a more diverse and productive forest understory and new forest age classes in the project area.

Effects of Habitat Fragmentation on Wildlife

While effects of forest fragmentation from activities proposed in the BCPA are expected to be less than those documented in more fragmented landscapes (i.e., where permanent conversion of forested conditions to non-forested conditions occur), adverse effects such as increased predation, competition, introduction of non-native plant species and isolation of less mobile species may occur.

The fragmentation effects on core habitat areas from harvest units and road placement were analyzed using a neighborhood analysis in GIS as previously described in Section 3.2.3 – Wildlife under Habitat Fragmentation. These values, 0 to 20, are the existing condition that is used to calculate the ecological cost of implementing management activities. The acreage of core habitat with a value of 15 to 20 is 1148 acres or about 11 percent of the BCPA.

Because timber harvest activities would change stand structure and its associated function, each proposed final harvest unit was overlaid on the existing forested core areas. For each final harvest unit, an "ecological cost" based on a scale of 1 to 10 was calculated based on their degree of effects to forested core areas. Final harvest units with a higher number indicated a higher ecological cost or effect to the forested core areas. In other words, if a clear cut unit were proposed to occur in the center of an unroaded, somewhat remote core area, the resulting fragmentation could be more adverse than if the unit were to occur adjacent to a 20 year old stand. The disturbance and noise created during management activities are also associated with the adverse effects of fragmentation.

Under Alternative 1, small canopy gaps are expected over time because of natural mortality of trees by aging, diseases, or natural disturbances. However, no significant edge or fragmentation effects, including disturbance, are expected under this alternative because the anticipated gaps would be small and localized.

Under Alternative 3, all proposed final harvests that fall within core areas valued at 15 to 20 were calculated and amount to approximately 341 acres. Three proposed final harvests (totaling 60 acres) fall within forested core areas and have an ecological cost of 10. Implementation of these final harvests would reduce the connectivity of forested core areas and travel corridors across the project area. Displacement of species that utilize forested core areas would be increased. Forested core area within the BCPA would be reduced from approximately 1148 acres (11 percent) to 807 acres (8 percent).

Alternative 4 was developed to address fragmentation effects in respect to final harvest units and road construction – new corridors. The three proposed units with an ecological cost of 10 and four units with an ecological cost of 9 were dropped from consideration. In addition to dropping or modifying high ecological cost units, all road construction proposals using new corridors and units associated with this new road construction were dropped under Alternative 4. This resulted in a reduction of removal cuts from 687 acres proposed in Alternative 3 to 309 acres in Alternative 4 and a reduction in all categories of reforestation activities. Of the proposed final harvest units that occurred within the core area valued at 15 to 20 (previously discussed), all were dropped from Alternative 4, except for 55 acres.

In Alternative 4, all high value core areas would remain intact. Habitat and species disturbance would be less thus reducing the amount of displacement that would occur within and from the forested core areas. No road construction-new corridors would reduce the amount of fragmentation and disturbance to wildlife associated with this activity. Maintenance to existing roads would occur and in some instances reduce or eliminate sedimentation.

Increases in fragmentation could result in temporary habitat losses in regenerating stands for forest-interior species such as the veery, ovenbird, wood thrush, and black-throated blue warblers, and certain amphibians such as red-backed salamanders and northern dusky salamanders (DeGraaf and others 1992). Other species such as red-tailed hawks and small snakes (for example, northern redbelly and eastern garter snakes) may benefit from these changes in wildlife habitats. Species that use the regenerating forest habitat conditions for foraging activities and the mature forest habitat condition for suitable nesting and roosting activities such as great blue heron, red-shouldered hawk, red-tailed hawk, and northern bobwhite may also benefit (DeGraaf and others 1992). Although populations of most forest interior species respond negatively when habitat cover drops below 20 to 30 percent of the landscape, sharp thresholds in landscape characteristics generally do not exist for most species (in particular, bird species) (Villard and others 1999).

Project Level Filter Approach: Effects on the Composition and Structure of MIS Wildlife Habitats

This section assesses potential effects on wildlife habitats associated with MIS for the ANF. Table 26 identifies projected changes in the amounts of habitat available to support MIS under each of the project alternatives over the next 10-year period. Because wildlife does not recognize management area boundaries, this analysis considered changes in vegetation age class at a

landscape scale. Details of the management area changes can be found in Tables 8, 9, and 10 in Chapter 2.

MIS for Early Successional Habitats

Under Alternative 1, no timber harvesting activities will occur in the BCPA. The amount of early-successional forest habitat would decrease over the next 10 years as existing seedling and sapling stands continue to mature (see Table 26). Over a longer period, some patchy natural tree regeneration may occur as a result of continued decline of the forest canopy in unhealthy or stressed forest stands. Without direct intervention to control competing vegetation and deer browsing; this regeneration will generally consist of lower quality habitat composed of American beech, striped maple, and birch. Permanent openings will remain unchanged under this alternative, or in some stands, experience encroachment by pioneer species.

These natural changes would tend to decrease available habitat in the BCPA for MIS that require early successional forest habitat such as the American woodcock and ruffed grouse. Small patches and understory inclusions of hemlock found near springs and seeps and in scattered locations would continue to provide important winter cover for ruffed grouse. Permanent openings, in particular, utility corridors, pipelines, and old well sites would continue to provide limited habitat for grouse and woodcock. Available forage and dense cover to support white-tailed deer and grouse would tend to decrease over time under Alternative 1.

Alternative 1 shows a higher percentage of mature forest and possible hard mast production (specifically beechnuts), which is a very important food source for ruffed grouse and deer. However, the dependency on beech as a mast-producer has been compromised because beech bark disease has impacted the ANF. The disease complex has already significantly reduced the total number of beech trees and the health and vigor of the remaining beech may be reduced. Since grouse and deer are generalists with a wide diurnal and seasonal range of movement, the overall density of these two wildlife species would not likely decrease appreciably. South-facing slopes, riparian corridors and densely stocked sapling stands that support a conifer component would continue to provide important winter habitat for white-tailed deer and ruffed grouse.

Under Alternatives 3 and 4, the amount of early successional habitat in the project area is proportional to the amount of final harvests proposed in each alternative (see Table 26). Site preparation, herbicide application, non-commercial release cuts, and fencing proposed in these action alternatives will help to regenerate fully-stocked stands of desirable tree and shrub species in the harvested areas. Although the understory cover of herbaceous and woody vegetation would be temporarily reduced during the first two seasons following herbicide applications, these effects will be temporary and will result in improvements in the structure and diversity of understory vegetation over the long term. Fencing will reduce the negative effects of deer browsing on other desired woody and herbaceous species and ultimately increase cover and soft mast-producing shrubs for wildlife. These activities would benefit American woodcock and ruffed grouse over the next 10-year period as the newly regenerated stands become established and continue to develop toward small pole size timber. The 23 acres of conifer inclusions in the mid and understory of several hardwoods stands in the BCPA would be maintained and continue to provide winter range for grouse and turkey, as well as deer.

White-tailed deer habitat would not be adversely affected by any of the proposed treatments and would likely benefit in the short term from increased production of browse created by the removal harvests. Exclusion of deer from regenerating stands using fencing would occur on 662

to 358 acres under Alternatives 3 and 4 respectively. This temporary reduction in forage habitat is not substantial when considered in the context of the amount of acreage proposed for final and intermediate harvests, the amount of area proposed for fencing, and the forage available across the BCPA.

MIS for Mature/Late Successional Habitats

Both action alternatives would result in reductions in availability of suitable mature forest conditions within the project area over the next 10 years. However, both alternatives would result in additional acres of late-successional forest habitat (see Table 24 and Table 26). Currently, about 82 percent of the BCPA consists of mature timber (more than 50 years old). Under Alternative 1 this would remain approximately the same in 10 years while it would decrease to 74 and 78 percent under Alternatives 3 and 4, respectively.

Under Alternative 1, available habitat for species requiring mature and late-successional forest types would remain essentially unchanged in the short-term as stands in the project area continue to slowly mature. Approximately three percent of the project area that is in the 101 to 110 year old age class would advance to an old growth classification in the next 10 years, but with little recruitment of pole-size stands into the sawtimber age class (51-110 years). Ample snags and den trees would be available in the BCPA from continued decline and death of individual trees. Over the long-term, these conditions would tend to benefit cavity nesting species that often prefer snags larger than 16 inches diameter such as the pileated woodpecker and species that build nests in larger trees such as the red-shouldered hawk and great blue heron.

Alternatives 3 and 4 would result in a seven percent and three percent reduction in the availability of mature and old growth forest conditions in the BCPA over the next 10 years thus removing some trees that would otherwise serve as potential snags and den trees. However, the harvesting activities across the landscape would help maintain a mosaic of forest habitat types and age classes that approximate natural disturbance regimes for the Allegheny Plateau (Ruffner and Abrams 2003). In addition, the overall age progression of stands in the project area would result in additional acres of late-successional forest. Implementation of Forest Plan standards and guidelines, mitigation measures, and design features would ensure retention of an adequate supply of snags, dens, and potential snags and dens for wildlife habitat in harvested stands. Similarly, standards and guidelines require protection of known nest trees. New nests discovered prior to or during project implementation would be protected and buffers applied as necessary.

Suitable habitat for the great blue heron and red-shouldered hawk occurs along riparian zones and in remote areas of mature forests. Riparian corridors in the project area are well buffered from the stands proposed for treatment under Alternatives 3 and 4, and riparian zones are protected by Forest Plan standard and guidelines.

The timber rattlesnake uses mature or regenerating deciduous forest containing suitable rock outcroppings for denning and basking. Although the proposed treatments could potentially increase early-successional foraging habitat for this species, the primary critical habitat for the timber rattlesnake is their den. While there have been numerous sightings of individuals within the project boundary, no hibernating dens have been confirmed. Biologist will continue to document sightings and monitor potential den sites so as to protect them in the future. Therefore, implementing any of the planned activities in Alternatives 3 and 4 likely would not impact any of these species, which are dependant on mature and late-successional forest habitat.

MIS for Mature Mixed-Conifer Habitats

Species that require a mixture of mature mixed conifer and deciduous forest types such as the hermit thrush, black-throated green warbler and barred owl would not be affected by Alternative 1 because no timber harvesting activities would occur, and stands in the BCPA would be continue to mature. Under Alternatives 3and 4, these species would be negatively affected in the short-term within the project area because mature trees would be removed. However, mature forest dominates the project area, and abundant mature forest habitat would continue to be available for these species. In addition, Forest Plan standard and guidelines and mitigation measures, including retention of an adequate supply of snags and den trees, would ensure availability of nesting habitat for these species in the project area. As a rule, conifer is retained in stands of MA 3.0 to increase or maintain a diversity of tree species and is always retained and enhanced in MA 1.0 and 6.1. Therefore, no negative effects are anticipated over the next 10 years for species such as the magnolia warbler that require young conifer habitat and also a full range of successional stages.

MIS for Cavity Nesting Species

Effects of the project alternatives on cavity nesting MIS, such as the yellow-bellied sapsucker, pileated woodpecker, and barred owl would essentially be the same as discussed previously for MIS in mature/late-successional and mature mixed-conifer habitats. An adequate supply of snags and potential nest trees would be maintained in the project area under all the alternatives over the next 10-year period through implementation of the Forest Plan standards and guidelines

MIS for Aspen Habitat

No adverse effects are anticipated for MIS such as beaver that require aspen forest type as a result of implementing any of the alternatives. The completion of aspen regeneration cuts would have a beneficial effect by retaining aspen where it occurs and planting aspen would increase this component in areas where it has died out. Suitable habitat for beaver is confined primarily to the riparian areas and floodplains of several streams within the project boundary. Forest Plan standards and guidelines would adequately protect riparian habitats from disturbance which would also protect aspen where it is often found as widely scattered clones. Proposed road maintenance and decommissioning would help protect water quality in the project and ultimately benefit water-associated species.

MIS for Aquatic Habitat

No significant effects are anticipated for aquatic MIS, such as the smallmouth bass or walleye. Suitable habitat for smallmouth bass and walleye does not occur in the project; therefore no direct or indirect effects are anticipated on these species. There are no streams in the BCPA listed by the Pennsylvania Fish and Boat Commission that support wild trout populations. Forest-wide management requirements and constraints are also in place to maintain the environment and water quality of intermittent streams, springs, and seeps from the effects of vegetation management. Proposed road maintenance and decommissioning under Alternatives 3 and 4 would help protect water quality in the project in the long run and is expected to result in modest benefits for brook trout within the watershed. As a result, there is no effect anticipated under any alternative that would adversely affect water quality, reduce the present designation of these streams as high-quality cold water fisheries, or adversely affect brook trout habitat.

Fine-Filter Approach: Effects on Federally Threatened or Endangered and Regional Forester Sensitive Species

This section presents a brief summary of the potential effects of the proposed BCP alternatives on threatened, endangered, and sensitive species and their habitats, using the fine-filter approach. There is no designated critical habitat for any federally-listed threatened or endangered species on the ANF; therefore, critical habitat issues are not presented in this project. The BA contains additional details of the potential effects of each of the proposed activities on federally-listed species and the BE (project file) describes the potential impacts on RFSS. Detailed information on the life history and distribution of each species on the ANF is provided in the BA.

The following sections present potential effects of the alternatives on six federally-listed threatened and endangered species, including the bald eagle, Indiana bat, small whorled pogonia, northeastern bulrush, clubshell mussel, and northern riffleshell mussel.

Bald Eagle

There are no nesting occurrences for this species recorded in the BCPA and only one roosting and foraging area with repeated use in the Upper Millstone valley. The proposed timber harvests and reforestation activities would not alter suitable habitat. Project activities take place a considerable distance from documented nesting, roosting and foraging habitat. Substantial buffer zones of mature hardwood forest and significant changes in topography exist between the proposed treatment areas and these known nest sites. The proposed activities are expected to have no effect on the bald eagle in the project area.

Indiana Bat

In spite of several seasons of surveying, the Indiana bat has not been documented in the BCPA. No effect on the species would occur under Alternative 1 since no timber harvesting or other activities would occur. A "may affect, not likely to adversely affect" determination was made for the Indiana bat for both action alternatives (Alternatives 3 and 4). The likelihood of direct mortality as a result of implementation of either action alternative is extremely unlikely to occur and considered discountable. The likelihood of indirect adverse effects to important habitat components for the Indiana bat as a result of implementation of either action alternative is extremely unlikely to occur and considered discountable. The rationale for this determination is documented in the BA for this project.

Small Whorled Pogonia

This rare orchid has not been found during field surveys in the BCPA or on the ANF; therefore, the alternatives do not pose a direct risk to the species. An estimated 6 acres of pit expansion and 4 acres of new pit development associated with Alternative 3 will result in a reduction of potentially suitable habitat. This reduction is not significant considering that these changes would occur over the next 10 years and across the project area. A no effect determination is reached for this species regardless of the selected alternative. The Forest Plan provides direction for the protection of this orchid.

Northeastern Bulrush

This wetland plant species has not been found during field surveys for the BCP or during a forest-wide wetland plant survey conducted by the WPC. Due to absence of documented occurrence of this species on the ANF and considering that Forest Plan standards and guidelines, mitigation measures, and design features (see Appendix B) would be implemented to protect wetland plants and suitable habitat, a "no effect" determination was reached for the northeastern

bulrush under any of the alternatives. The BCP in combination with other past, present, and foreseeable future activities within the CE area would not jeopardize the continued existence of this species

Clubshell Mussel and Northern Riffleshell Mussel
These species have not been documented in the BCPA. In addition, no suitable habitat has been identified for the clubshell mussel or the northern riffleshell mussel in the project area. Previously approved or future projects are generally positioned in upland locations and all federal activities on the ANF provide protection for water resources regardless of their size or quality. As a result, no effect determination is reached for both of these species under any of the alternatives.

Regional Forester Sensitive Species

The BE determined that the proposed activities would have no impacts that would lead to federal listing for any of the 60 sensitive species on the ANF. Table 19 lists the species for which the BE concluded their status in the BCPA. Four species were considered to have occupied habitat within the BCPA (1) timber rattlesnake, (2) ski-tailed emerald, (3) mountain brook lamprey, and (4) gilt darter. Determinations for these four species are summarized as follows:

Timber Rattlesnake
The timber rattlesnake is a RFSS with suitable occupied habitat in the project area, but confirmed dens and associated basking sites have not been documented. There have been many confirmed sightings of rattlesnakes in the analysis area; consequently, there is a chance that migrating or foraging individuals (especially males) use portions of the project at least for limited periods of time.

Regarding potential habitat, field records indicate rock outcrops and boulders are found within the BCPA. Some of these surface features may provide suitable den or basking habitat, but rattlesnake use of these specific features has not been confirmed. The presence of rocks and boulders increases the likelihood that rattlesnakes may frequent the project area. These features would be protected and maintained through the implementation of project design features and mitigation measures under Alternatives 3 and 4.

Alternative 1 would not impact this species because no forest management activities would occur. Under Alternatives 3 and 4, foraging habitat would be altered with the completion of the overstory removals and shelterwood removals where mature forest habitat is converted to early successional habitat. Timber harvests in the project would leave a substantial amount of coarse woody material across the forest floor increasing foraging opportunities. Gravel pit expansions would convert forest habitat to permanent openings that could provide potential basking habitat.

Timber harvests and reforestation activities that use heavy machinery in the BCPA create a risk to foraging rattlesnakes because they could be harmed or harassed if activities occur during the species' active period. The addition of roads and the increased activity associated with management activity will increase vehicle/snake and human/snake encounters thus increasing the potential for snakes to be run over or poached.

Considering the risks to individual snakes and the impacts to habitat across the BCPA over a 20-year period it is concluded that these activities may impact foraging individuals but will not cause a trend toward federal listing of this species. Should foraging individuals or den sites be discovered during implementation of any alternative or in the other anticipated projects, Forest

Plan standards and guidelines would be applied to protect this species. Efforts will continue to educate forest-users about the biological benefits of this reptile in order to reduce the potential of harming rattlesnakes during chance encounters with forest-users.

The remaining three species with occupied habitat, **ski-tailed emerald, mountain brook lamprey,** and **gilt darter**, will be addressed with the following species that have suitable habitat within the BCPA but have not been documented in the project area. These are: **butternut, Wiegand's sedge, creeping snowberry, thread rush, rough cotton-grass, yellow-bellied flycatcher, harpoon clubtail, Uhler's sundragon, Maine snaketail, zebra clubtail, wood turtle, white trout lily, sweet-scented Indian plantain, stalked bulrush, red currant, boreal bog sedge, kidney-leaved twayblade, mountain starwort,** and **bartran shadbush**. These RFSS are associated with aquatic, riparian, floodplains, wetlands, sphagnum swamps, and saturated spring habitats. The primary threats to these species include degradation of water quality, radical changes in vegetation that could influence water quality and flow, pollution, and sedimentation.

No timber harvesting or reforestation activities would occur under Alternative 1; as a result, there would be no impact to these species or their habitat.

Under Alternatives 3 and 4, implementation of Forest Plan standards and guidelines, mitigation measures, and design features would ensure that the BCP and any future projects on NFS lands in the analysis area would have no impact on these aquatic/riparian-associated species. In addition, there are an abundance of laws and regulations protecting streams and wetlands in Pennsylvania and under the jurisdiction of various resource agencies.

Currently, OGM developments occur at low levels across the BCPA and any new developments would follow an approved erosion and sedimentation plan to safeguard the waters of the Commonwealth of Pennsylvania.

The remaining species on the RFSS list (Table 19) that have suitable habitat within the BCPA but have not been documented in the BCPA includes the northern goshawk and the northern flying squirrel.

No timber harvesting or reforestation activities would occur under Alternative 1; as a result, there would be no impact to these species or their habitat.

Based on the rationale provided in the BE and the standards and guidelines that provide protection to active nests, there are no impacts expected on individual goshawks but suitable habitat would be altered under alternatives 3 and 4. However, the BCP would not cause a trend toward federal listing for the northern goshawk.

After extensive monitoring, only one location of the northern flying squirrel has been documented in Northwestern Pennsylvania. The BE concluded that future loss or reduction of the conifer component within the BCPA could be detrimental to this species. With the implementation of project design features to retain conifer and placement of 20 squirrel nest boxes, potential habitat would be maintained and enhanced under alternatives 3 and 4. Providing nest boxes would also provide opportunities for monitoring, which may yield information about this species. As a result, none of the alternatives are expected to cause a trend toward federal listing for this species.

Eight upland plant species have suitable habitat within the BCPA but no individuals have been documented in the project area. These include **bristly black currant, hooker's orchid,**

mountain wood fern, Canada yew, American ginseng, checkered rattlesnake plaintain, queen-of-the-prairie, and **American fever-few**.

No timber harvesting or reforestation activities would occur under Alternative 1; as a result, there would be no impacts to these species or their habitat.

The BE has analyzed the impacts to these species under Alternatives 3 and 4 and has determined there would be no impacts to individuals but suitable habitat would be altered. However, neither alternative would cause a trend toward federal listing for any of these species.

As discussed in the BE (in Project File), no suitable habitat has been documented for the following RFSS within the BCPA. As a result, no direct or indirect impacts would occur for any of these species under any alternative. Regardless of the alternative selected, this project would not cause a trend toward federal listing for these species. **Osprey, creek heelsplitter, rabbitsfoot, rainbow mussel, rayed-bean, round pigtoe, sheepnose, snuffbox, threeridge, Wabash pigtoe, white heelsplitter, long-solid mussel, green-faced clubtail, midland clubtail, rapids clubtail, mustached clubtail, longhead darter, spotted darter, Tippecanoe darter, gravel chub, channel darter, bluebreast darter, burbot, mountain madtom, northern madtom, ocellated darner,** and **resolute damsel.**

Summary
For the RFSS known to exist in the BCPA and the species with suitable unoccupied habitat in the BCPA, the "likelihood of persistence" of these species is high under all alternatives. Some habitat may be altered but not to the detriment of any species or at a level of causing a trend toward federal listing. A tentative new list of RFSS has been available for several years; therefore, district biologists gathered background information in regards to habitat requirements and biology for each species and incorporated them into our regular survey program. The BE incorporated data obtained from these surveys in order to reach determinations for these species.

Cumulative Effects
The CE analysis period is a reasonable length of time in which environmental changes have happened and are likely to happen again. The temporal boundaries for the CE analysis of biological resources are from 1996 to 2026 (10 years in the past and 20 years into the future). The spatial boundaries used to consider effects to the physical and biological resources from the implementation of the BCP, are the same as those used for the analysis of direct and indirect effects.

The CE analysis area encompasses 10,347 acres including 6,224 acres of MA 3, 1,963 acres of MA 6.1, and 2,061 acres of MA 1, plus 99 acres of private land. This CE area, private land plus NFS lands, was selected because these lands have shared natural disturbances and stresses and occur within same watersheds. The disturbances that have occurred include wind, insect infestations, such as elm spanworm and gypsy moth, repeated droughts, and tree disease complexes including sugar maple decline and beech bark disease that have adversely affected forest health and wildlife habitat. In addition, federal and private land within the CE area share common vegetation types, wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and cultural uses as well as potential future impacts. Other disturbances including noise, soil disturbance, and the physical movement of machinery created by logging typically do not extend beyond one ¼-mile.

In addition, wildlife species that are generalists, such as deer, are least impacted by management activities because they are mobile and capable of relocating and adapting to new areas. Generally, the species most susceptible to disturbance and impacts are those that utilize specific features, such as rock outcrops, have small home ranges, use ancestral conditions, and/or are easily disturbed. Some species are impacted by all of these limitations. These species are those that fall under the fine filter management strategy which requires an analysis at a small scale in order to recognize potential impacts and to prevent loss of populations. Therefore, the size of the project area, 10,347 acres is a more than adequate scale to analyze the potential impact of this project and future projects on all wildlife species.

Cumulative Effects of Habitat and Management Indicator Species

The following is an analysis of cumulative effects from vegetation management as outlined in Table 23 and Table 27and OGM development to affected wildlife and wildlife habitat.

Cumulative effects (CE) on wildlife habitat can occur as a result of changes in the spatial patterns of land uses or cover types, age class of vegetation, and changes in land use intensity across a landscape. The biological CE area is a mosaic of public and private lands predominantly forested and including a variety of age classes and forest types. This land base contains approximately 10,347 acres, which includes 10,248 acres of NFS lands and 99 acres of private lands. The project area contains portions of MAs 1.0, 3.0, and 6.1. Approximately 736 acres of NFS lands in the CE area is opening habitat such as gravel pits, cultural sites, and other openings while 2 acres of private land is in permanent openings.

Wildlife habitat across public and private land in the CE area has been minimally affected by the development of approximately 54 oil and gas wells (plus their access roads and service lines) over the last century. These privately owned mineral leases are projected to develop an additional 63 acres within the CE area over the next 20 years. An additional 9 acres are expected to be cleared for pit expansion to obtain material to build new lease roads. These numbers are calculated using a formula that estimates oil and gas development across the ANF. Considering the past use of this area, oil and gas development is expected to be lower for the BCPA then those projected using this formula. Permanent OGM openings would continue to provide limited habitat for the species dependant on early-successional vegetation and openings, such as ruffed grouse and woodcocks. Species requiring mature and late successional habitats would also be adversely affected by OGM developments, mostly due to road development and the creation of permanent openings.

In all alternatives, mature mixed-conifer dependent species, such as the magnolia warbler, would continue to nest and forage in edge habitats associated with regenerating stands, permanent openings, utility corridors, and past disturbances. Areas of conifer inclusions will be retained to provide vegetation diversity and to support species that require this habitat feature. Standards and guidelines to reduce impacts of management to riparian corridors will also retain conifer components where it occurs.

Based on analysis of recent harvest within the CE area, approved harvests for other projects, and OGM development, no major changes are anticipated in the intensity or effects of management activities over the next 20 years. The proposed silvicultural treatments in combination with actions approved by other projects, as documented in Table 27 are not anticipated to result in significant impacts on sensitive forest-interior species. Appropriate Forest Plan standards and guidelines would be applied in these treatment areas. Some species may move to adjacent mature

forest habitats, while many mature forest species, including some Neotropical migrants, will continue to utilize the site or will move back within a few years of treatment. The number of early-successional species may increase in the short-term because of the temporary openings.

Wildlife species that require specific features such as tree cavities, aspen, and rock outcrops, may be temporarily displaced by disturbance related to management. The features, however, will always be made available through protection and retention. Therefore there will be no cumulative effects to these species from timber harvest activities over the next 20 years.

Table 27. Past, present and Future Timber Harvests Projected for the Cumulative Effects Analysis Area 1996-2026

Timber Harvest Activity	1996-2006 Present Condition	2007 – 2026 Alternative 1	2007 – 2026 Alternative 3	2007 – 2026 Alternative 4
Final Harvest (percent of the CE analysis area)	0%	9%[1]	16%	12%
Intermediate Harvest (percent of the CE analysis area)	0%	9%[1]	14%	12%

1. Percentages reflect cumulative totals of past (previously approved 1996 – 2006) plus projected future treatments anticipated in the 10,347-acre CE analysis area including private land.

Under Alternatives 3 and 4, there are 6.0 and 1.5 miles road construction proposed respectively and 3.0 miles of decommissioning in both action alternatives. The existing road network will receive maintenance to adequately support management activities from 2006 to 2026 which is expected to have a positive effect on water quality. No shifts in public access routes are expected and forest roads are expected to continue to function at their present traffic service levels. Because of state and federal regulations in regards to maintaining water quality and by using best management practices, road development and maintenance will have no effect on sensitive, critical, or specialized wildlife habitat.

Based on the age class distribution and acres of non-forest and forested land in the CE analysis area, **Table 28** displays the amount of primary habitats expected to be found at the end of the analysis period (2026) under each alternative.

Table 28. Cumulative Distribution of Habitat for the Cumulative Effects Analysis Area 2006-2026

Habitat Condition	2006 Present Condition	2026 Alternative 1 No Action	2026 Alternative 3	2026 Alternative 4
Permanent Opening (percent of the CE analysis area)	7%	7%[1]	7%	7%
Seedling/sapling Habitat (1-20 years)	6%	9%[2]	14%	12%
Mature Forest Habitat – 51+ years (percent of the CE analysis area)	81%	72%	67%	69%

1. Percentages reflect cumulative totals of anticipated OGM development including gravel pit expansion for new lease roads. Increases in opening habitat from pit expansion associated with proposed road maintenance in Alternatives 2 and 3.
2. Percentage reflects cumulative totals of previously approved and anticipated final harvests outside the BCPA but within the CE analysis area including projected final harvests on private land.

No substantial increases in opening habitat would occur, less than 1 percent is expected to be converted into permanent openings due to OGM development. Although increases in seedling/sapling (early successional) hardwood habitat is anticipated, these increases are not substantial especially considering the change would occur over a 20 year period. Decreases in mature forest habitat are anticipated and amount to about 0.6 percent per year over the analysis period.

No unusual or unexpected developments are anticipated or projected for private land in the CE area. It must be noted that future activities on private property are based on state-wide trends and remain somewhat speculative at any time.

Cumulative Effects on Habitat Fragmentation

A study conducted in the Monongahela National Forest of West Virginia concluded that cuts placed within extensively forested areas did not produce significant edge effects 15 years after harvest (USDA-FS 2006c, p 105; Dugway and others 2001). As a result of harvesting the stands, a small percentage of landscape may remain fragmented within a large tract of forest over a short period of time. Furthermore, temporary edge effects produced by the contrast between recent cuts and mature stands are reduced during forest succession. Activities such as road building, OGM developments, private land use and utility corridor establishment can cause loss of forest habitat, create permanent forest openings and edge habitats, and may potentially reduce forest interior environments. There is currently 1,148 acres of existing core habitat within the CE boundary, much of which consists of herbaceous openings, upland and bottom land savannahs and wetlands. The majority of wildlife species that these systems support are species that have adapted to open systems and early-successional vegetation, such as grouse and woodcock. Core habitat will be retained under all alternatives (see Table 11) and would continue to provide connectivity to larger core areas and travel corridors located outside of the boundary. While fragmentation and edge would continue to be created, no permanent edge effects are anticipated

from timber harvests proposed under Alternatives 3 and 4 or future OGM development or vegetation management.

Cumulative Effects on Federally Threatened or Endangered, and Regional Forester Sensitive Species

The BA and BE determined that BCP alternatives and other human activities would exert different impacts on individual TES and RFSS. Cumulative impacts on sensitive species occur primarily as a result of human disturbances associated with the timber harvest, recreation activities, and OGM development.

Cumulative impacts on the timber rattlesnake could result from all action alternatives because the biggest threat to the rattlesnake involves encounters with humans and vehicles. There is currently minimal OGM development within the CE area. However, future OGM development (well pads and access roads) could restrict migration of the timber rattlesnake. Additional roads increase access, which has the potential to increase human/snake and vehicle/snake encounters. It is not known at what level migration restrictions cause population isolation or possibly extirpation; therefore, management strategies always consider a corridor approach to provide connectivity for a wide range of species. Historic rattlesnake dens would continue to be monitored, rattlesnake sightings would be documented, and potential rattlesnake habitat protected. These measures enable district biologists to retain travel corridors across the landscape thus promoting or maintaining rattlesnake populations over time. Increased plant diversity resulting from timber harvests and reforestation activities in the CE area may provide enhance foraging habitat for the timber rattlesnake.

On a landscape scale, while the northern flying squirrel or its habitat could be adversely impacted by future OGM development (through loss of habitat), future infestation of the hemlock woolly adelgid (HWA) poses the greatest risk to the northern flying squirrel. If the HWA reaches the ANF, the impact and subsequent mortality of large hemlocks along stream bottoms could be severe to the northern flying squirrel (Steele and others 2004) and without an effective control measures for the HWA up to 50 percent of the mature hemlock on the ANF could be lost. To date, the HWA has not been found within the ANF or the BCPA.

No adverse cumulative impacts are anticipated for species that utilize riparian, floodplain, wetlands, sphagnum swamps, or spring seep habitats. Each of these species depends on intact, well-functioning aquatic and riparian ecosystems. Potential effects to soil and water resources are analyzed in Sections 4.1.1 and 4.1.2. Measures to maintain water quality and protect soils are described in Section 2.1.4. Implementation of these measures along with Forest Plan standards and guidelines and Pennsylvania BMPs would ensure that the proposed and future activities planned for the CE area would not adversely impact these species or their habitat over the long term. If critical habitat or populations are found of any of these species, standards and guidelines and mitigation measures will be applied to ensure their protection.

No adverse cumulative impacts are anticipated for the plant species that utilize upland habitats. Activities that have the potential to adversely impact these species are discussed in the BE. A survey is conducted, prior to analysis, to document the occurrence of these plants and if they are found protection measures would be implemented. Additionally, if these plants are found during implementation of the proposed activities, appropriate protection measures would be applied to avoid impacts to these species. Therefore, the BCP would not impact individuals and would not cause a trend toward federal listing of these species.

The BA for the six federally-listed endangered and threatened species on the ANF determined that the CE area does not have suitable habitat and would have no direct, indirect, or cumulative effects on the: (1) northern riffleshell mussel, and (2) clubshell mussel. Potential cumulative impacts on the remaining listed species are as follows:

- **Small Whorled Pogonia** (***Isotria medeoloides***) – As a result of timber harvest and OGM development, suitable habitat for small whorled pogonia will be reduced on an average of 12 percent of the CE area. This is based on the reduction of mature forested stands. The remaining 69 percent of the CE analysis area will continue to occur as suitable small whorled pogonia habitat. No cumulative effects are anticipated on the small whorled pogonia considering that this species has not been documented on the ANF and within the project area.
- **Bald Eagle (*Haliaeetus leucocephalus*) –** Timber harvest and OGM development will occur at a considerable distance from the small amount of foraging habitat available to the bald eagle. There are no treatments proposed within one mile of documented foraging/roosting area for bald eagle and the closest nest location is more than 10 mile north and west of the BCPA. As a result, cumulative effects on the bald eagle from the proposed actions and OGM activity are not substantial.
- **Indiana Bat (*Myotis sodalist*) –** Both positive and negative effects can be anticipated from timber harvest and OGM development on the Indiana bat. The management activities could result in improved thermal conditions of suitable roost trees adjacent to removal cuts and well pads and along roads and pipelines. Indiana bat roosting habitat will be maintained and potentially improved in areas where development occurs. However, bat habitat can be adversely affected from these management activities by reducing the overall amount of available habitat. The BA determined that suitable habitat would be reduced under both project alternatives; however, Indiana bat habitat will continue to occur on more than 68 percent of the CE analysis area under all alternatives.
- **Northeastern Bulrush *(Scirpus ancistrochaetus)*** – There are no substantial cumulative effects on the northeastern from federal and non-federal activities within the CE analysis area. The species would not be adversely affected because a) this bulrush has not been documented within the BCPA or the ANF, b) field surveys of vernal ponds and wetlands in the BCPA did not find this plant, c) field surveys continue to be conducted on federal land on a project-specific basis on any soil disturbing project proposed on federal land, d) suitable bulrush habitat remains widely distributed and relatively abundant across the wetlands within the Forest, and e) it is very likely that similar growing conditions are found on private land within the CE area.

4.3 Social Environment

The following sections describe the direct, indirect, and cumulative effects on heritage, scenery, recreation, economics, and public health and safety.

The temporal boundaries for the cumulative effects (CE) analysis of all social resources are from 1996 to 2026 (10 years in the past and 20 years into the future). This time period provides an overall view of the incremental impact of vegetation management and OGM activities in

combination with current project proposals. The spatial boundaries for the social resources are described and a rationale provided by resource.

4.3.1 Heritage

Heritage resources within the BCPA comprise short-term prehistoric occupation sites and historic era sites related to logging, oil and gas development, and homesteads. Such sites are most likely to satisfy significance criterion D for the National Register of Historic Places eligibility.

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires state and federal agencies to avoid degradation or destruction of sites eligible for the National Register. Until evaluated, recorded sites must be managed as though they have been determined eligible for the National Register. At this time, all known heritage resources identified in the BCPA must be treated as eligible for the National Register and will be avoided.

Alternative 1: No Action

Direct and Indirect Effects

No proposed activities would occur; therefore, there would be no affects since there would be no change to heritage resources.

Alternatives 3 and 4

Direct and Indirect Effects

Neither action alternative would affect heritage resources since all known heritage resources have been avoided through the use of buffers or project design. Mitigation measures and design features such as avoidance have been successfully applied on the ANF for many years. In addition, upon completion of treatments, skid trails are routinely blocked with "slash" and otherwise made impassable to vehicular traffic, effectively reducing ease of access to heritage sites.

Cumulative Effects

The CE analysis area for heritage resources is the BCPA. The CE area was chosen because the parcels of public and private land within the project boundary share common vegetation types, wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and past historic uses as well as future impacts.

All known heritage resources sites in the BCPA would be avoided by all of the proposed activities for all alternatives. Future projects would be reviewed for heritage resources to ensure that heritage sites and resources are protected. Project-level activities can be designed or dropped to avoid effects to heritage resources.

However, heritage resources are subject to impacts beyond the proposed project activities. Within the BCPA, and in other areas on the ANF, impacts to heritage resources could occur due to a variety of reasons. Cross-country horseback riding is occurring in the BCPA. The impact of footprints can damage both historic and prehistoric sites. Illegal ATV riding is also occurring in the BCPA. ATV riding can affect heritage resources with as little as a single ride over an area or by long-term use and entrenchment of trails. Heritage resources are also subject to damage by natural causes, such as rodent burrowing and windthrow. There are no anticipated cumulative effects to heritage resources from the proposed or foreseeable future activities in any alternative.

4.3.2 Scenery

This section will disclose the reasonably foreseeable impacts (environmental consequences) to scenic resources within the BCPA that would result from implementing the proposed alternatives and associated activities described in Chapter 2. Direct, indirect, and cumulative impacts will all be discussed. The scenery analysis is based upon the VMS scenery management tool and utilizes two primary indicators for measuring impacts: (1) changes to the existing landscape character type of the project area, and (2) whether the project area and alternatives meet the Forest Plan Visual Quality Objectives.

Alternative 1: No Action

Direct and Indirect Effects

If Alternative 1 were implemented, there would be no change from the current condition of the scenic resources since no proposed activities would take place. The impacts of this Alternative will serve as the baseline for which to compare the impacts of Alternatives 2 and 3.

Landscape Character Type

Any changes in nature to vegetation would be the result of natural stand development or disturbance processes. Areas needing reforestation treatments to ensure an adequate regeneration sequence would remain untreated. Stands with high densities would not have the visual depth or age class diversity, which are characteristics of greater scenic value.

Visual Quality Objectives (VQOs)

Implementing Alternative 1 would result in no effect to the project area's capacity to meet VQO goals. The existing condition would remain, and the visual quality of the landscape would not change.

Alternatives 3 and 4

Direct and Indirect Effects

If Alternatives 2 or 3 were implemented, proposed activities described in Chapter 2 would be implemented and their visual impacts would be as follows.

Landscape Character Type

All vegetation management activities have some effect on the appearance of the forest. For scenery analysis purposes, timber harvest treatments fall into three broad categories: 1) final harvest treatments, 2) partial harvest treatments, and 3) reforestation treatments. The extent of the visual effects of silvicultural treatments depends on which treatment is used.

The most obvious changes are from harvesting activities that remove large numbers of trees and/or understory vegetation, and add woody debris (slash) to the forest floor. The dead or dying brown leaves of slash often contrast with surrounding green vegetation and create a highly visible impact temporarily.

Final harvest treatments proposed in the BCP include overstory removals and shelterwood removals. These treatments have the greatest impact on scenery, especially when they are located along sensitive travelways. Final harvest treatments remove the majority of the canopy from a stand allowing the sunlight to reach the ground and stimulate new seedling growth. With the canopy gone, the area no longer has a mature forest character and management is apparent. As a result, visual mitigations or design features may need to be prescribed, and sometimes alternate treatments have to be negotiated in order to meet VQOs. Soil disturbance during and immediately after harvesting operations may also has an impact on the visual landscape.

Although most areas will re-vegetate on their own, heavily impacted areas such as log landings may need to be graded and seeded with grasses. Skid trails may also need to be seeded. Within one growing season, these heavily impacted areas become green and blend into the natural landscape again softening the visual contrast of the harvest. When the new vegetation is established, the altered site has a natural appearance that is within the ANF standards of a visually acceptable landscape. Although final harvest treatments can improve the visual environment in the long run, without mitigations and or design features, they generally only achieve the VQO goals of modification in the short run.

Partial harvest treatments proposed in the BCP include the following vegetative management activities: shelterwood seed cuts, thinning, group selection, and salvage. These treatments do not have as great of an impact on scenic resources because they only remove a portion of mature trees and maintain the appearance of an intact natural forest. The removal of trees that are dead, damaged, or susceptible to disease and pests helps to maintain a healthy stand. Visual impacts of any significance are usually confined to foreground (USDA-FS 1977, p. 15). The degree of visual impact depends upon the stand character, number and frequency of entries, and speed of the viewer. Based on past experience, most of the activities associated with partial harvesting methods meet the VQO goals of Partial Retention and exceed the VQO for Modification allowed by the Forest Plan in MA 3.0.

Reforestation treatments include such activities as site preparation, herbicide application, release, fencing, planting, and fertilizing. Site preparation involves killing competing understory and midstory vegetation that hinder seedlings development, either through chemical or mechanical means. The visual impact of reforestation treatments is most noticeable immediately after application when the vegetation dies back, but this impact is less and in shorter duration than the impact of timber harvesting. Within one to three years, the new growth of seedlings and other herbaceous vegetation recover and restore the area to a naturally appearing landscape once again. Planting may be needed in open areas where sufficient seedlings do not develop. Once the plants are established, the vegetation provides additional variety and screening. Reforestation treatments improve the ability of a stand to reach maturity and have a positive long-term effect on visual quality.

Fencing stands protects young seedlings from the impacts of deer browsing; allowing them to grow rapidly and helping them return the site to a more natural appearing condition. The fencing and clearing around the perimeter of a stand are noticeable only in foreground areas. In most cases, fences blend into the landscape as they are constructed of a dull galvanized wire. The fencing is removed when the tree seedlings are tall enough to be out of reach of the deer (approximately 7-10 years).

Visual Quality Objectives (VQOs)

The effect of implementing Alternative 3 or 4 upon the project area's ability to meet VQO guidelines is analyzed in Table 29. The prescriptions units listed are those that are proposed near to a SL 1 or 2 viewing area. Prescription units that are not listed in this table but proposed under Alternative 3 or 4 have been left out because they would meet VQO and are not seen from a SL 1 or 2 view area. Units that do not meet VQO require mitigations or design features. Whether a prescription unit meets VQOs or not is evaluated using the National Forest Landscape Management Handbook No. 559 (USDA-FS 1977). Again, whether the project area meets VQOs depends upon how visually evident the proposed "human activities" are and to what extent they

repeat/borrow the form, line, color, and texture from the characteristic landscape or contrast with it.

Table 29. Visual Analysis

Comp/ Stand	Timber Prescription	Viewing Area	VQO	Meet VQO?
657-037[1]	Thinning	West Branch Millstone Creek	PR	Yes
657-038[1]	Shelterwood Seed Removal	West Branch Millstone Creek	PR	Yes
662-015	Shelterwood Seed Removal	Millstone Creek	PR	Yes
662-010[1]	Thinning	Millstone Creek	PR	Yes
667-002	Thinning	SR 3002	PR	Yes
667-018	Thinning	SR 3002	PR	Yes
662-035[1]	Shelterwood Seed Removal	SR 3002 and Loleta Recreation Area	R	Yes[2]
662-118	Shelterwood Seed Removal	SR 3002	PR	Yes
662-116	Shelterwood Seed Removal	SR 3002	PR	Yes
662-117	Thinning	SR 3002	PR	Yes
662-079	Thinning	SR 2005/3002	PR	Yes
662-065	Shelterwood Seed Removal	SR 2005	PR	Yes[2]
662-080	Shelterwood Seed Removal	SR 2005	PR	Yes[2]
663-031	Thinning	SR 2005/3002	R	Yes
663-060	Thinning	SR 2005/3002	R	Yes
657-001	Thinning	SR 2005	PR	Yes
663-015	Thinning	SR 2005	PR	Yes
658-017[1]	Shelterwood Seed Removal	SR 2005	PR	Yes[2]
664-002[1]	Shelterwood Seed Removal	FR 157	PR	Yes
659-004[1]	Shelterwood Seed Removal	Songbird Sojourn Trail	PR	Yes
660-003[1]	Shelterwood Seed Removal	Buzzard Swamp Trail	PR	Yes
660-028[1]	Shelterwood Seed Removal	FR 130 (ASL)	M	Yes
661-035	Thinning	FR 130 (ASL)	M	Yes
661-080[1]	Shelterwood Seed Removal	FR 130 (ASL)	M	Yes
660-025[1]	Shelterwood Seed Removal	FR 130 (ASL)	M	Yes
661-036[1]	Shelterwood Seed Removal	FR 130 (ASL)	M	Yes [2]
661-078[1]	Shelterwood Seed Removal	FR 130 (ASL)	M	Yes [2]
661-034[1]	Shelterwood Seed Removal	FR 130 (ASL)	PR	Yes
661-088[1]	Thinning	West Branch Millstone Creek	R	Yes
661-087[1]	Shelterwood Seed Removal	West Branch Millstone Creek	R	Yes[2]

Notes:
[1] Stands removed from Alternative 3.
[2] Yes, with standards and guidelines and design features.

Retention Areas

There are few proposed treatments that lie in within the VQO of Retention. Stands 661088, 663031, 663060 are located in Class A scenery and are proposed for thinning under Alternative 3. All three would meet VQO guidelines. Stand 661087 is for proposed for shelterwood seed cut followed by shelterwood removal cut of 27 acres. This stand straddles VQOs, but most of it lies in Retention. Because of its size, ¼ acre leave areas would be needed to help mitigate the effects of such a large opening in the canopy. Stand 662035, which is also proposed for shelterwood sequence, is located near Loleta Recreation Area. It is 37 acres in size and would also need ¼

acre leave areas and edge feathering to help reduce visual impacts. In alternative 4, both of these stands would be dropped from treatment.

Partial Retention Areas

Stand 662035 can be seen along SR 2005 and from Loleta Recreation Area. This stand is almost 40 acres in size and design features are proposed to meet VQOs. This includes leaving reserve areas and thinning stand edges to minimize contrast with the surrounding forest. Stands 662116, 662117, and 662118 were also reviewed because of their proximity to Loleta Recreation Area. None of the three would affect the view from Loleta as the closest unit is a thinning, which would allow much of the overstory crown to remain, and the other two shelterwood treatments are unseen because of the topography. Many other treatments can be seen from SR 2005 (SL1) and SR 3002 (SL 1). The proposed thinning of stands 663031, 663060, 657001, 662117, and 662079 would all meet VQO without mitigations or design features. With thinning, most of the canopy remains and an opening does not become visually obtrusive. For proposed shelterwood sequences for stands 662065, 662080, and 658017, design features include limiting roadside openings providing roadside buffers, and locating leave areas to help minimize the impact of removing canopy. Tree marking paint and fencing design features would also be implemented. By leaving wildlife reserve trees and areas and undulating the boundary of the proposed timber harvest, these proposed treatments would appear less dominant and blend in with the surrounding environment. Slash treatments would also reduce the impacts of logging residue. The location of log landings could be visually obtrusive if they are located within sight of the SR 2005 and SR 3002. Design features would include locating and/or screening landings from view. Proposed parking areas may be used as log landings along SR 2005 SR 3002. With these design features, this treatment area would meet VQO of Partial Retention. There are other timber prescriptions proposed within Partial Retention areas, but these prescriptions are not easily perceived from view areas and other design features would not be needed to meet VQOs.

Modification Areas

Several of stands proposed for treatment lie in Modification areas. Stands 660028, 661035, 661080, 660025, 661036, 661078, and 661034 are proposed for timber harvest under Alternative 3 along FR 130 (SL 2), which is part of the Allegheny Snowmobile Loop (ASL) Trail. All of these stands are proposed for shelterwood sequence treatments with the exception of stand 661035, which is proposed for thinning. Because of their proximity to the trail and size of area to be treated, design features would be implemented to protect the snowmobile trail and viewsheds. Design features would include restricting the time when hauling, road maintenance activities, and felling or skidding activities occur away from weekend or holiday periods when the trails are in high use. Fencing would be buffered away from the trails. Snowplowing would leave an adequate mat of snow for snowmobiling. For stand 661036, design features limiting roadside openings and spacing roadside opening apart would be used. A buffer would be implemented between the road and the treatment areas. With these design features, the proposed treatment units would meet VQOs. All other treatment proposals that have a VQO of Modification lie in unseen areas of the forest or along roads that have an SL 3 classification (lowest concern for scenery). VQO management goals for Modification areas allow human activities to dominate the landscape when they do not occur in foreground or middle ground viewsheds of visually sensitive areas and as long as they borrow naturally established design elements of form, line, color, and texture. All of these treatments would meet the VQO of Modification. Under Alternative 4, all proposed shelterwood treatments along FR 130 would be dropped. Stands 661078 and 661036 would be changed to uneven-aged management, which would meet VQO.

Maximum Modification Areas
Most of the project area has a VQO of Maximum Modification and most of the prescription units lie within this area. Most of the Maximum Modification area lies in unseen areas of the forest or along roads that have a SL 3 classification. All proposed treatment units would meet the VQO of Maximum Modification.

Cumulative Effects
The cumulative impacts analysis boundary for scenery resources is the BCPA. The CE area was chosen because the parcels of public and private land within the project boundary share common vegetation types, wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and past historic uses as well as future impacts.

The main purpose of scenery mitigations/design features is to meet the Visual Quality Objectives (VQOs) along sensitive travelways. Short-term effects may be an issue in visually sensitive corridors. Slash treatments address visual impacts for 1-3 years while slash decomposes and the disturbed ground heals naturally or is reseeded (Hoffman and Palmer 1996, pp 8-10). Previous monitoring has demonstrated that applying mitigations in visually sensitive corridors on the ANF is effective in dealing with short-term effects (USDA-FS 2001b pp 78-82). Monitoring reviews and timber sale inspections of past projects also confirm the effectiveness of mitigations/design features.

Vegetation Management Activities
All vegetation management activities have some effect on the appearance of the forest. However, direct and indirect effects to visual quality would be small and local. Effects would not be noticeable after approximately 10-15 years following regeneration harvests and sooner in intermediate or uneven-aged silvicultural treatments.

The standard practice on the ANF is to maintain VQOs by design, modification, or design features. Measures such as timing of harvest and slash treatments are helpful to reduce the visual impacts of vegetation management activities. They provide a level of visual quality during the 1 to 3 years it takes for slash to decompose and other ground vegetation to re-establish. These measures are very effective in the rainy and very humid climate of northwestern Pennsylvania.

Mitigations and design features can also help with long-term effects that might be evident for 3-20 years. Leave strips and reserve clumps left in the foreground can naturalize an opening by creating variety in the landscape. This natural appearing landscape character may be effective for as many as 20 years – the time it takes for young trees to appear as a new forest. In some case altering treatment type, size and shape – or leaving the area alone – may be another form of mitigation.

All alternatives would maintain the VQQs currently defined for the project area in accordance with the Forest Plan. In addition, visual monitoring is conducted on a random basis every five years to ensure practices meet Forest Plan guidelines. In 99 percent of the cases, the monitoring demonstrates that the visual standards equal or exceed desired conditions (USDA-FS 1998, p 60). Previous monitoring has also demonstrated that implementing VQOs in visually sensitive corridors on the ANF is effective in dealing with short-term effects (USDA-FS 2001b, pp 78-82). The standard practice on the ANF is to maintain VQOs by design, modification, and/or mitigation measures. Future Forest Service activities would be designed to meet VSOs.

Therefore, no meaningful cumulative effects to scenery resources are anticipated as a result of the proposed or foreseeable future activities

Oil and Gas Management Activities
An additional cumulative effect to scenery resources is OGM (Oil, Gas, and Mineral) development. Mineral owners have the right to access NFS lands to develop their mineral estates. The ANF's management objective is to negotiate to the greatest extent possible with individual developers to manage and protect the surface resources while allowing the development of their mineral rights. There are currently 54 existing wells within the BCPA. The number of wells being developed across the ANF has increased over the past ten years, and it is anticipated that over the next twenty years, the number of new wells and accompanying roads will continue to increase in the cumulative impacts area. The development of OGM can change at any time and is based on economics, technology, supply, and demand. The effects of expanding OGM development on scenery resources would increase the evidence of human activities and alterations in characteristic landscape elements of form, line, color, and texture.

4.3.3 Recreation

This section will disclose the reasonably foreseeable impacts (environmental consequences) to recreation resources within the BCP project that would result from implementing the proposed alternatives and associated activities described in Chapter 2. Direct, indirect, and cumulative effects will be discussed. As mentioned, the recreation analysis is based upon the Recreation Opportunity Spectrum (ROS) and utilizes two primary indicators for measuring impacts: (1) whether the alternatives are consistent with Recreation Opportunity Spectrum (ROS) settings, and (2) changes to recreation activities and use patterns in the project area.

Alternative 1: No Action

Direct and Indirect Effects
If Alternative 1 were implemented, there would be no change from the current condition of the recreation resources since no proposed activities would take place. The impacts of this Alternative will serve as the baseline for which to compare the impacts of Alternatives 3 and 4.

Recreation Opportunity Spectrum (ROS)
Under Alternative 1, all ROS indicator settings including access, remoteness, site management, visitor management, social encounters and visitor impacts would remain the same as the existing condition. Therefore, ROS objectives would be met in MA 1.0, MA 3.0 and 6.1. If this alternative were implemented, road maintenance would continue on roads and trails.

Recreation Activities and Use Patterns
Implementing Alternative 1 would result in no effect on recreation activities and use patterns within the BCPA. All recreation activities would continue as at the present, but parking would still be an issue and safety hazard during the bird dog trials during the spring and fall.

Alternatives 3 and 4

Direct and Indirect Effects
If Alternatives 3 or 4 were implemented, proposed reforestation activities described in Chapter 2 would be implemented and their recreation impacts would be as follows. Harvest activities are expected to occur over a 3-5 year period.

Recreation Opportunity Spectrum (ROS)

For comparative purposes, the effects from implementing any of the three alternatives upon the BCPA's current ROS classifications as Roaded Natural and Semi-Primitive Motorized are shown in Table 30 and described here. Table 30 compares the alternatives based upon ROS setting indicators. The values listed under Alternative 1 are the same as those given in the description of the existing condition found in Section 3.3.3 and Table 22.

Table 30. Comparison of Alternatives by ROS Setting Indicators

Setting Indicators	Alternative 1		Alternative 3		Alternative 4	
	Roaded Natural	**Semi-Primitive Motorized**	**Roaded Natural**	**Semi-Primitive Motorized**	**Roaded Natural**	**Semi-Primitive Motorized**
Access	Meets	Inconsistent	Meets	Inconsistent	Meets	Inconsistent
Remoteness	Meets	Meets	Meets	Meets	Meets	Meets
Site Management	Meets	Meets	Meets	Meets	Meets	Meets
Visitor Management	Meets	Meets	Meets	Meets	Meets	Meets
Social Encounters	Meets	Meets	Meets	Meets	Meets	Meets
Visitor Impacts	Meets	Meets	Meets	Meets	Meets	Meets

In terms of recreational impacts, Alternatives 3 and 4 are similar and will be discussed together.

Roaded Natural Area: Most of the silviculture treatments are proposed within this ROS classification. The Roaded Natural area would also see 6.0 miles of road construction on existing or new corridors under Alternative 3, 1.5 miles under Alternative 4, and 3.0 miles of road decommissioning under both action alternatives. Proposed road maintenance activities such as limestone surfacing, grading, etc. would occur on project area roads to insure a safe and adequate transportation system for members of the public and to implement management activities. Precautions would be implemented to ensure public safety during peak transportation periods of timber hauling. Proposed activities would improve access to the area. In terms of remoteness, the increased noise and traffic from harvest activities would not be out of the norm for Roaded Natural areas as frequent "sights and sounds of man" are the norm. The few recreation facilities, Buzzard Swamp and Loleta Campground, would not be affected, and the development level of the area will not change. Visitor management would remain the same. Social encounters may also temporarily increase due to timber harvest operations in both MA 1.0 and MA 3.0 because some displacement would occur. The impact of reforestation activities might send some users into other areas. But, the number of displaced recreationists would be limited as most areas in the project area receive low to moderate use. Loleta campground would continue to have moderate social encounters. Visitor impacts are expected to remain light. Thus, no change to the values of the Roaded Natural ROS setting indicators is expected.

Semi-Primitive Motorized Area: Stands 661010, 662010, 661087, 661088, 661090, 663031, and 663060 are proposed for timber harvest in the Semi-Primitive Motorized Area under Alternative 3. Only stand 661010 is proposed for treatment under Alternative 4. No road construction or road decommissioning is proposed in the Semi-Primitive Motorized Area under either action alternative. Proposed road maintenance activities such as limestone surfacing, grading, etc. would occur on some roads to insure a safe and adequate transportation system for members of the public and to implement management activities. Hence, access to the area will remain the

same under either alternative, the value of which is still inconsistent with ROS standards because of the traffic service level (TSL) C roads (FR 377 and FR 387). During harvest activities, a sense of remoteness will be lessened as a result of noise and increased traffic, but the remoteness indicator is already inconsistent with ROS standards because the area is within a 30-minute walk of TSL C roads. Site development is minimal in this area and would not change under either action alternative. Resource modification would take place during timber harvests and reforestation activities, but an effort to harmonize modifications with the environment would be made through standards and guidelines and design features. Social encounters may also temporarily increase due to timber harvest operations in the project area because some displacement would occur. The impact of timber harvests and reforestation activities might send some users into other areas. But, the number of displaced recreationists would be limited as most areas in the project area receive low to moderate use. No change to the values of the Semi-Primitive Motorized ROS setting indicators is expected.

Recreation Activities and Use Patterns

In general, the proposed activities in Alternatives 3 or 4 would have a limited effect on recreation activities and use patterns in the project area. Some recreation activities (camping, hunting, or hiking) may see a decrease in use as a result of proposed activities, but others may actually increase (bird watching or hunting for species that are dependent on early successional habitat) (USDA-FS 1986, p. 4-23). Field observations indicate that many recreationists, who are affected by timber harvesting and road construction and maintenance activities, will simply move to another location and resume their recreation experience, often within a few miles.

Road construction and maintenance activities would generally improve the roads within the BCPA and permit better access to ANF lands across the project area. Driving for pleasure is a very popular activity on the ANF, especially during the spring, fall color, and hunting seasons. Alternative 3 proposes the expansion of 6 existing pits to supply gravel for road construction and maintenance activities, and Alternative 4 proposes the expansion of 4 existing pits. Each alternative also proposes the development of new pits. Some forest visitors may be impacted as these pits would temporarily not be accessible for camping, target shooting, or parking vehicles for other dispersed activities such as hunting, berry picking, etc.

The effect of herbicide on recreation use may be a displacement of forest visitors to adjacent areas of the forest for their recreational activity for one or two months after treatment depending on one's personal preference.

Developed Recreation: Stand 662035 is the closest proposed timber harvest treatment to the lower camping loop of Loleta Recreation Area and is only proposed under Alternative 3. Because it is located over 900 feet uphill through a heavily wooded area, no noise, visual, or other impacts would be expected. The edge of stand 662117 would be slightly visible at a couple of places from the upper camping loop, but this stand is located on the crest of the hill where it plateaus. This stand is proposed for thinning so much of the overstory will remain; and therefore no visual impact is expected.

Hiking Trails: Stands 659004, 660003, and 660016 are located over 400 ft. or more from the Songbird Sojourn Interpretive and the Buzzard Swamp Trails. At this distance, none of the proposed harvest activities would affect hikers. Log landings would be located further from the trail near FR 379, so no impacts are expected. All of these stands, except for stand 660016, are dropped from treatment in Alternative 4.

Motorized Trails: Silviculture treatments are proposed for stands along the ASL. FR 130 is part of the ASL and a thinning treatment is proposed for stand 661035 under both action alternatives, which is adjacent to the road. Shelterwood treatments are proposed in Alternative 3 for stands 660025, 660028, 661036, and 661080, which are also adjacent to FR 130. In Alternative 4, these stands are dropped from treatment except for stand 661036, which is proposed for uneven-aged management. As a design feature for each of these stands, fencing would need to be located at least 50 feet away from the ASL. Hauling, road maintenance, felling, or skidding activities within 100 feet of the ASL would not be permitted on weekends during the winter activity season. Also, commercial and administrative traffic would also be required to travel with their lights on during favorable snowmobile conditions. With these mitigations and design features, no impacts to the ASL are expected.

Dispersed Camping: No impacts are expected to dispersed camping sites found in the project area from the proposed activities in the action alternatives.

Hunting and Fishing: Hunters would be slightly impacted by proposed activities in Alternatives 3 and 4. Seven additional parking areas are proposed along FR 130, SR 2005, and SR 3002, which would benefit hunters. Hunters may be displaced in the short tem by timber harvest activities, but in the long term, treatments would add variety to habitats found along the roads and in general forest and possibly attracting more game species. In final harvest treatments, hunting would improve for species dependent upon early-successional habitat. However, the resulting slash may make it more difficult for persons with limited mobility to move through these stands. Road access and those roads open for the fall hunting season would not be impacted by this project. The majority of stands proposed for final harvests are proposed for fencing. Fencing may also have an impact on hunters, as it may impede mobility through the forest. As a result, some hunters would be displaced to adjacent areas until the fences were taken down. However, there is a small group of hunters, who like to hunt within fences. Fishing opportunities would not be impacted by either action alternative. Water quality and aquatic habitat would be protected through Forest Plan standards and guidelines, mitigation measures, and design features. Access to fishing areas would remain the same after project implementation.

***High Recreation Use Corridors*:** The high recreation use corridors (SR 66, SR 2005, SR 3002, FR 157, Songbird Sojourn Trail, and Buzzard Swamp Hiking Trail) would receive limited impacts under either action alternative. SR 2005 and SR 3002 would have some visual impacts, but use of the highway itself would not be affected. As outlined in the scenery resources section, mitigation measures and design features would be used to decrease visual impacts.

Special Events or Unique Features: The bird dog trial events would benefit from increase parking areas from implementation of either action alternative. Safety would be improved in the area, and visitor convenience would be enhanced as a result of these alternatives.

Other Recreation: No impacts are expected to any other forms of recreation that take place in the project area including mountain biking, walking, firewood cutting, scenic driving, berry picking, and target shooting.

Cumulative Effects

The CE analysis area for scenery resources is the BCPA. The CE area was chosen because the parcels of public and private land within the project boundary share common vegetation types,

wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and past historic uses as well as future impacts.

People recreating on the ANF may find the forest more and more crowded in the future as the demand for recreation activities increases. However, recreationists, who are willing to travel, would still be able to find areas of solitude and naturalness. Therefore, cumulative impacts to recreational activities and/or use patterns are not expected for any of the alternatives.

Recreation Activities
In the past ten years, a sweet smelling toilet (SST) was added to the Buzzard Swamp FR157 trailhead in 1998. Otherwise, no other recreation projects were completed or are planned within the cumulative effects boundary.

People recreating on the ANF may find the forest more and more crowded in the future as demand for recreation increases. However, recreationists, who are willing to travel, would still be able to find areas of solitude and naturalness. Therefore, cumulative impacts to recreational activities and/or use patterns are not expected for any of the alternatives.

Vegetation Management Activities
The age of stands within the cumulative impacts boundary was compiled to illustrate how well recreationists would be able to use the area. Claims are often made that timber harvesting has reduced recreation opportunities on the ANF. However, the effects of timber management on recreation do not accumulate over time. Even though new harvest treatments (<20 years of age) may be more difficult for recreationists to use because of fencing, slash, and/or thick sapling or briar growth, most recreationists are able to utilize young (21-50 years of age) and mature forest (51< years of age) stands.

Table 24 shows the age classes of timber for each alternative within the cumulative effects boundary. The existing condition in 2006 is compared with the likely future condition of each Alternative in 2026. This comparison will illustrate how much timber management is apparent to recreationists, as well as their ability to use the area.

Table 24 shows that less than six percent of the project area has been harvested recently, which is the more difficult forest condition for recreationists to use. Most of project area appears to be mature forest or savannah and is accessible by recreationists. If Alternative 1 were implemented, the existing condition would continue to mature uninterrupted. In twenty years, with no new final harvest treatments, the CE area would have twice as much timber in the young forest stage as it currently does, and the majority of the forest stands would continue to advance through the mature forest stage. If Alternative 3 were implemented, seven percent of the CE area would be in the regeneration stage for the next two decades, eight percent in the young forest stage, and the majority of the project area would be in the mature forest stage. If Alternative 4 were implemented, three percent of the CE area would be in the regeneration stage for the next two decades, eight percent in the young forest stage, and the majority of the project area would also be in the mature forest stage. Under all three alternatives, around 11 percent of the project area would grow into late-successional forest. The greatest difference between the existing condition and the three alternatives is that the percentage of mature forest would decrease slightly. But because the overall numbers are so similar to the existing condition, this demonstrates that the activities proposed in the action alternatives are consistent with past management and compatible with current recreation use.

Oil and Gas Management Activities
An additional cumulative effect to recreation is OGM development. Mineral owners have the right to access NFS lands to develop their mineral estates. The ANF's management objective is to negotiate to the greatest extent possible with individual developers to manage and protect the surface resources while allowing the development of their mineral rights. There are currently 54 existing wells within the project boundary. The number of wells across the ANF has increased over the past ten years and it is anticipated that over the next twenty years, the number of new wells and accompanying roads will continue to increase in the CE area.

The development of OGM can change at any time and is based on economics, technology, supply, and demand. The effects of expanding OGM development on recreation would be a loss of solitude (machinery noise and vehicle traffic), easier access (additional road miles), a more modified environment (additional roads and wells), and a reduction in visual quality. These effects do accumulate over time and may result in further concentrating recreation use on areas of public land that have not been developed for oil and gas extraction. Field observations show that intensively developed OGM fields do not receive the same density of recreational use, as do undeveloped areas in the same MA.

4.3.4 Economics

This section will disclose the reasonably foreseeable impacts (environmental consequences) to economic resources that would result from implementing the proposed alternatives and associated activities described in Chapter 2. Direct, indirect, and cumulative impacts will all be discussed.

Alternative 1: No Action

Direct and Indirect Effects
No monetary implementation costs would result other than the normal custodial or stewardship costs associated with managing a National Forest. Secure Rural Schools Act payments to the local counties would occur if the Act is renewed; however, no monetary return to the federal treasury from timber harvest would happen.

Alternatives 3 and 4

Direct and Indirect Effects
Table 31 shows a comparison of relative cost and returns for each alternative based on the expected volume of timber production. This should not be interpreted as actual yields or losses, or as an attempt to analyze all resources values. The Forest Service recognizes that many values generated by the various alternatives involve goods and services not priced in the marketplace and thus not represented in this comparison. These goods and services include, for example, habitat for native species, birding, fishing, hunting, hiking, snowmobiling, viewing scenic beauty, and maintaining high-quality water. Effects of each alternative on these non-priced goods and services are discussed elsewhere in this chapter under other resource headings.

In considering the effects on recreation activities in the project area, it is recognized that the proposed management activities could negatively affect some recreationists in their use of the land scheduled for treatment. Based on the short-term impacts to recreational resources and the potentially beneficial impacts that would result from the proposed activities (enhanced wildlife habitat supporting hunting, viewing wildlife species, berry picking, etc.), the balance of these effects would indicate no significant effect on recreation income or related jobs.

Alternatives 3 and 4 would result in the harvest of approximately 9 MMBF and 5 MMBF of timber, respectively. According to the FY 2005 Timber Sale Information Reporting System, the value of timber sold from the ANF in FY2005 was $24.6 million (includes sawtimber and pulpwood). In FY 2005, the ANF sold 32.4 MMBF of timber and the average value of timber sold was $1,382 per thousand board feet (MBF). Over the past several years, timber values have increased annually on the ANF, and this trend is expected to continue into the foreseeable future. Twenty-Five Percent Fund or Secure Rural Schools Acts payments to the local counties would occur.

Activities proposed under Alternatives 3 and 4 would be expected to impact the local economy through the creation of jobs for contractors, who purchase timber, primary and secondary wood processors, who hire local people to harvest , haul, and process timber, and service contractors, who perform reforestation work and wildlife habitat improvements. A multiplier effect occurs when any of these forest workers spends money for goods and services at local businesses and service providers. Local employment also supports the needs of people coming into the area to hunt, fish, and enjoy other recreation activities.

Table 31. Economic Analysis of Costs/Returns to U.S. Government

	Alternative 1	Alternative 3	Alternative 4
Total Costs[1]	$720,000	$3,210,354	$2,298,267
Total Returns[2]	$0	$12,438,000	$6,910,000
Net Cash Flow[3]	**(-) $720,000**	**$9,227,646**	**$4,611,733**

[1] Total costs represent the cost to the U.S. Government from implementing activities such as road construction and maintenance, herbicide application, fence installation, site preparation, and sale planning/administration.

[2] Total returns represent the revenues generated from the harvest of timber on NFS lands.

[3] Net cash flow is calculated by: (Total Return – Total Cost)

Cumulative Effects

The CE analysis area for economics includes the four counties in which the ANF is located as the people located in these counties would be most affected by activities on the ANF including the BCP.

In summary, the action alternatives, which include timber harvesting, would contribute to a continuous flow of forest products from the ANF during the period of this cumulative effects analysis. This flow of forest products from the ANF has been a source of jobs and income and would be expected to provide the same benefits into the future. The effects of obtaining the economic benefits from timber harvest do not exclude other forest uses that provide priced and non-priced benefits (for example, camping and bird watching). In contrast, if Alternative 1 was selected, no harvest activities would occur and associated economic benefits would not be realized. However, selecting Alternative 1 would not preclude the harvesting of timber in the future.

Environmental justice involves fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental policies and projects. The effects of Alternatives 3 and 4 would be positive on both minority and low-income populations. Timber harvesting has the potential to create or support industry and jobs in the region. Alternative 1 would not provide the benefits mentioned above, as this alternative does not include harvest proposals. As documented in the recreation section of this chapter, there would be no loss of recreation or tourism opportunities in the project area as a result of the proposed activities under any alternative.

4.3.5 Human Health and Safety

This section will disclose the reasonably foreseeable impacts (environmental consequences) to human health and safety that would result from implementing the proposed alternatives and associated activities described in Chapter 2. Direct, indirect, and cumulative impacts will all be discussed.

The risk to forest visitors of falling trees always exists in a forest setting, where high winds and wet, shallow soils can cause healthy, live trees to topple. Some dead trees are purposely left standing for wildlife, and these trees also pose a risk of falling. Additional trees may die naturally after harvest operations are completed.

Alternative 1: No Action

Direct and Indirect Effects

The existing conditions would not be affected.

Alternatives 3 and 4

Direct and Indirect Effects

Indirect minor risks to human health and safety would result from the proposed activities. However, timber harvest areas would be marked, loggers would be present at the site when activity is occurring, and the activity would be noisy, -- all of which provide warning to anyone who would be nearby. The risk for loggers would increase as the level of harvest increases. This risk would be mitigated by following standard safety practices of the industry, to include traffic safety signs.

Loggers and mineral developers would be notified of planned activities. Close coordination with them, careful operation of logging equipment, and identification of facilities to be protected would minimize impacts on mineral developments with negligible risks to associated personnel.

Herbicides have been used to control interfering vegetation in stands throughout the ANF for years. No adverse effects on human health and safety have been reported as a result of herbicide treatment within the project area. Potential impacts from controlling interfering plants with herbicides have been examined in detail in the Understory Vegetation Management FEIS (USDA-FS 1991a) and DEIS for the 2006 Proposed Forest Plan (USDA-FS 2006a, Appendix G). The FEIS for Understory Vegetation Management states that the risks to workers from the proposed use of glyphosate and sulfometuron methyl are negligible (USDA-FS 1991a, pp. 4-8 to p. 4-10, Appendix A, pp. 5-4 to 5-17).

Public contact with the pesticides or residues is expected to be minimal. Spraying notification signs would be posted along roads or trails or at other locations where there is easy access to a

treatment area. They would alert people that these areas have been or would be treated so they can stay out of the area if they choose to do so.

Water testing conducted in 1987 and 1988 on the ANF showed no detectable levels of herbicide downstream from treatment areas (USDA-FS 1991a, p. 4-4). More recent monitoring work of herbicide treatments in 1999 conducted on power line rights-of-way has shown the same results. In 1999, water samples collected downstream from a rights-of-way treatment contained no detectable herbicide with buffer strips as narrow as 13 feet for cut stem treatment (with glyphosate) or 58 feet for low volume foliar treatment (USDA-FS 2000b).

The effect of herbicide on water quality was evaluated in 2002. A stream on the Bradford Ranger District was monitored adjacent to a 15-acre forested stand from August 7-24, 2002, when the herbicide was applied. Laboratory analysis of the water samples did not detect the presence of glyphosate, aminomethyl phosphoric acid, or sulfometuron methyl. Consequently, water quality and beneficial uses were protected. Based on the effectiveness of these Forest Plan standards and guidelines, water quality would be maintained at a level that supports the propagation of fish and other aquatic species. No significant adverse effects are expected from the proposed herbicide application under any of the alternatives. No impacts are expected to water quality of domestic or public water supplies near sites proposed for herbicide treatment.

One potential effect of vegetation treatments would be to the people involved in resource activities associated with equipment to rupture oil and gas pipelines caused by operating skidders or spray equipment in areas where pipelines and power lines occur.

Cumulative Effects

The CE analysis area for human health and safety includes the BCPA. The CE area was chosen because the parcels of public and private land within the project boundary share common vegetation types, wildlife habitats, drainage patterns, climate, geology, disturbance regimes, access, and past historic uses as well as future impacts.

The cumulative risk to the forest users from the proposed timber harvest activities and associated reforestation activities is expected to be low because of the use of Forest Plan standards and guidelines and management practices. Cumulative effects to human health are not likely to occur because none of the herbicides are persistent in the environment or in the human body (USDA-FS 1986a, Chapter 4, p 21 and Appendix A, Section 5, p 15, Chapter 2, pp 6-8, Chapter 4, pp 1-5).

Irreversible Commitment of Resources

An irreversible commitment of resources is an action that alters a resource such that it cannot be replenished or replaced. An archaeological site is an example of an irreversible resource. Each archaeological site is a finite resource, and once it is altered or destroyed, the character of the resource is forever changed or lost.

With the implementation of mitigation measures and design features, only one such irreversible commitment of resources associated with any of the alternatives remains. The use of stone and gravel from existing stone pits for road maintenance would result in minor (approximately 10 acres) irreversible loss of this salable, common variety mineral resource and would result in a minor change to the landscape of the stone pits.

Irretrievable Commitment of Resources

An irretrievable commitment of resources is an action that results in a resource loss that can be replenished or replaced over a period of time. Under the alternatives, the timber harvested would be considered an irretrievable resource. Over time, regeneration measures are expected to produce timber volume that equals or surpasses the volume harvested.

CHAPTER 5: LIST OF CONTRIBUTORS

USDA-Forest Service

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- Nathan Welker, Hydrologist
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- Tanya Catignani, GIS Mapping

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PERSONAL COMMUNICATIONS

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Appendix A--Scoping Comments Summary (1998, 1999, and 2003)

Introduction

The Brush Creek Project was first scoped for an environmental assessment on May 5, 1998. Changes in forest direction resulted in the decision to accomplish an environmental impact statement (EIS). This resulted in a Notice of Intent (NOI) published in the Federal Register in early 1999. Scoping was again accomplished. The project was then deferred due to changes in forest priorities. Notice of Intent was published again in the Federal Register on March 7, 2003, and a third scoping period begun. On June 28, 2003, the Marienville Ranger District conducted a tour of the Brush Creek Project Area (BCPA). Based upon more recent analysis, the NOI to accomplish an EIS has been withdrawn. It has been decided that an environmental assessment (EA) will be the basis for determining whether or not an EIS will be accomplished.

The 1998 and 1999 proposals used a project area that included approximately 10,706 acres, and proposed 624 and 487 acres of early-age class development, 405 and 356 acres of other timber harvesting, 7.7 and 7.3 miles of road construction, and 60 and 407 acres of wildlife habitat improvements, respectively. The 2003 proposal used a project area that included 12,680 acres, and proposed 731 acres of early-age class development, 409 acres of other timber harvesting, 7.9 miles of road construction, and 380 acres of wildlife habitat improvements. The 2006 proposal includes a 10,347-acre project area and proposes 702 acres of early-age class development, 539 acres of other timber harvesting, 6.0 miles of road construction, and 494 acres of wildlife habitat improvements.

The following is a list of respondents organized by scoping round. Comments will be identified with the respondent's initials and year submitted to distinguish the round of scoping:

1998 Scoping

MD-98	–	Marie Davis, Ridgway, PA
JS-98	–	Jim Snyder, Pittsburgh, PA
JW-98	–	John Wood, Edinboro, PA
FS-98	–	Frank Suska, McMurray, PA
GMD-98	–	George and Mike Davis, Scottsdale, PA
HE-98	–	Heartwood, Jim Bensman, East Alton, IL
FC-98	–	Forest County Commissioners, Gerald L. Cussing, Jr., County Commissioner, Tionesta, PA
EH-98	–	Edward Henschel, Jr., Marienville, PA
JK-98	–	John A. Keslick, Jr., West Chester, PA
BF-98	–	Bradford Forest Products, Mark Conelly, Bradford, PA
PF-98	–	Payne Forest Products, Donald Payne, Kane, PA
MF-98	–	Melville Forestry Services, Martin Melville, Centre Hall, PA
NE-98	–	North East Hardwoods, Joseph D. Plummer, Marienville, PA
PFI-98	–	Pennsylvania Forest Industry Assoc., Dale Anderson, Kane, PA
ADP-98	–	Allegheny Defense Project, Michael Kaizar, Pittsburgh, PA
EG-98	–	Eloise Glenn, Pittsburgh, PA
FG-98	–	Forest Guardians, Byron Bird, Santa Fe, NM

1999 Scoping

EH-99	–	Edward Henschel, Marienville, PA
GG-99	–	Greg Georgic
HEP-99	–	Heartwood, Charles Phillips, Columbia, MO
HEB-99	–	Heartwood, Jim Bensman, East Alton, IL
RW-99	–	Russell S. Walters, Russell, PA
LN-99	–	Leo Nashadka, Mt. Jewett, PA
FG-99	–	Forest Guardians, Byron Bird, Santa Fe, NM
NE-99	–	North East Hardwoods, Joseph D. Plummer, Marienville, PA
DC-99	–	Dave Cashell, Lower Burrell, PA

2003 Scoping

APAW-03	–	Association for the Preservation of American Wildlands, Jeff Phillips, Richmond, VA
DL-03	–	Doris Loud, Millerton, PA
TS-03	–	Theresa Strazisar
LV-03	–	Lisa Vaughan
TB-03	–	Thomas Bachelder, Shiloh, OH
NF-03	–	Noah Fulmer, Freehold, NJ
RN-03	–	Ryan Neeper
RTS-03	–	Ridgway Township Supervisors, Ridgway, PA
RGS-03	–	The Ruffed Grouse Society, Mark Banker, Lemont, PA
RP-03	–	Raymond Paul, Mt. Jewett, PA
ADP-03	–	Allegheny Defense Project, Jim Kleissler, Clarion, PA
PHMC-03	–	PHMC, Carr, Kurt W., Harrisburg, PA
EDZ-03	–	Edwin and Darlene Zubal, Freeport, PA
JN-03	–	Justin Newell, Harrisburg, PA
RF-03	–	Robert F. Foreman, Pittsburgh, PA
TK-03	–	Thomas A. Kruckvich, Marienville, PA
DE-03	–	Dale B. Edwards, Franklin, PA
MV-03	–	Martin T. Victor, Hiller, PA
JK-03	–	John A. Keslick, Jr., West Chester, PA
RL-03	–	Ralph H. Lutz, Pittsburgh, PA
AC-03	–	Alex Clark, Sigel, PA
RM-03	–	Randy R. Miller, Chicora, PA
RH-03	–	Robert A. Hilyer, Marienville, PA
JG-03	–	James P. Grundy, Mercer, PA
EH-03	–	Edward G. Henschel, Jr., Marienville, PA
GC-03	–	Gerald L. Cussins, Jr., Marienville, PA
KJ-03	–	Kirk Johnston, Warren, PA
TM-03	–	Thomas D. Masters, Sr., Sharpsburg, PA
JD-03	–	Joe Davis, Vienna, OH
JR-03	–	Jean Rowan, Pittsburgh, PA
BS-03	–	B. Sachau, Florham Park, NJ
MY-03	–	Mark Yokim, Pittsburgh, PA
SS-03	–	Shannon Shuey, Ridgway, PA

BB-03	–	Bob Bleattler
TKS-03	–	Thomas Kaye, Sr.
TKJ-03	–	Thomas Kay, Jr.
EK-03	–	Emma Kaye
MH-03	–	Mary Jane Hammel
DA-03	–	David Aumack
RB-03	–	Robert Blackinston
RL-03	–	Ross Leonardo, Jr.
JB-03	–	John Blackiston
PS-03	–	Pam Singleton
JH-03	–	Jack Hedlund, Kane, PA
KC-03	–	Kelly H. Compeau, Pittsburgh, PA
ML-03	–	Matthew M. Lovenduski, Force, PA
HE-03	–	Heartwood, Jim Bensman, Wood River, IL
WN-03	–	Warren Nichols
MN-03	–	Mary Nordkvelle
AS-03	–	Autumn E. Sabo, Harrisburg, PA
MYE-03	–	Mervin Yeany, Waynesburg, PA
RL-03	–	Ryan D. Little
MC-03	–	Mathew Campbell
ADP-03	–	Allegheny Defense Project, Clarion, PA
DA-03	–	David Aumack
ADP-03	–	Allegheny Defense Project, Ryan Talbott, Clarion, PA
FORM01-03		Form Letter 1

All comment letters were analyzed and considered. Site-specific comments that raise an issue, which is a point of disagreement, debate, or dispute with a proposed action based on some anticipated effect, are responded to in this analysis and summary. In addition, comments that request clarification or more discussion, give new information, question analytical techniques, or suggest new alternatives are responded to. Comments must be site-specific and address the proposed action to have such merit.

Some, but not all non-issue comments are included in this summary. Non-issue comments were eliminated from the summary for reasons including being outside the scope of the proposed action, the concern is already decided by law, regulation or policy, the concern would be better decided by subsequent decisions, or the concern is not site-specific.

One form letter was identified during the 2003 scoping process (hereafter referred to as FORM01-03).

Comments were analyzed and categorized as follows:

I. Preliminary Issues
II. Non-Issues – comments, questions, information requests
III. Alternatives Suggested by the Public
IV. Significant and Non-Significant Issues

I. Preliminary Issues

An issue is a point of disagreement, debate, or dispute with a proposed action based on some anticipated effect. Preliminary issues are the initial public issues raised during scoping before significance is determined.

Two preliminary issues were identified prior to the 2003 scoping: Road Management and Even-aged/Uneven-aged Management. They are included below as preliminary issues 4.g. and 3.b., respectively.

1. Planning Process

a. No preliminary planning process issues were identified. Many respondents requested that an environmental impact statement be developed. It has been decided that an environmental assessment (EA) will be the basis for determining whether or not an EIS will be accomplished.

2. Affected Environment

a. The Forest Service must not attempt to use "patch clearcutting" in place of "group selection." Group selection does not use area regulation, it uses diameter distribution regulation. The Forest Service also needs to consider the research done in Illinois on Group Selection. The research identified group selection openings as "ecological traps." Many species [bird species] were attracted to the openings, which appeared to be suitable habitat. These species, however, did not successfully reproduce due to predation and cowbird parasitism. The study concluded, "If land is to be logged, single tree selection at low volumes removed (<20%) and long (15-20 year) cutting intervals is the method that will have the least adverse impact on forest bird communities." (HE-98)

b. No harvesting should be done on slopes greater than 15 percent due to erosion problems. (ADP-98)

c. Potential for a shallow water impoundment for waterfowl exists on Millstone Creek. This area, identified on the scoping letter map as Compartment 674, south of Forest Road 226, is treeless with huge and ancient stumps. (EH-98)

d. I suggest eliminating the 1,354 acres of herbicide application as a way of maintaining soil and water quality. (KJ-03)

3. Vegetation Management

a. The larger of the two-aged areas appears to be stocked with smaller timber and harvesting should be deferred. In the other areas marked for two-aged management, the treatment may be appropriate. (BF-98, PF-98, and MF-98)

b. The Forest Plan regarding the primary silvicultural system to be used in each management area. The primary silvicultural system for MA 3.0 is even-aged management. Uneven-aged management is an option to be considered for inclusions such as riparian areas, wet soils, or visually sensitive areas.

The practice of even-aged management maintains a sustained flow of high quality sawtimber from the Allegheny hardwood forest. It is especially appropriate and

successful in the Allegheny and upland hardwood types, which are comprised of tree species that are intolerant of shade. Uneven-aged management could provide vegetative and structural diversity and habitat for interior species. Uuneven-aged management features tree species that are shade tolerant, such as beech, sugar maple, and hemlock. The long-term feasibility of uneven-aged management on the Allegheny Plateau is uncertain with beech bark disease, sugar maple deline and mortality, and the probable occurrence of the hemlock wooly adelgid in the near future. (Preliminary issue identified in 2003 scoping)

4. Transportation Management

a. I protest the construction of additional road mileage for this project. (MD-98)

b. I oppose all new road construction and road restoration. I oppose all new stone pits and stone pit expansion. (EG-98)

c. We're opposed to any new forest access roads near our camp. (EDZ-03)

d. If the effort is to protect the waterways, there should be zero miles of new road construction, and many more miles of roads decommissioned. Other roads that should be decommissioned include FR 760, 166, and 226. In the EIS, please include these in proposals, as this may lead to the best health of the Allegheny's southern waters. (KC-03)

e. Road segment 787 does not need reconstruction, an off road landing could be built instead. (BF-98, PF-98, MF-98)

f. I prefer less easy access to larger areas. (FC-98)

g. The Brush Creek project area contains an array of Forest Service, state, and private roads. A Road Analysis Process (RAP) has been completed for the Brush Creek area. The RAP evaluated Forest Service and private roads and their effects on the ecosystem and made recommendations for road-related management.

For the proposed action, the road system was evaluated to determine if new access is needed, if the existing road system is adequate (and any improvements are needed), and if any roads need to be decommission for resource protection or other reasons. Roads provide access for recreation, timber, and wildlife management. However, roads can also reduce opportunties for unroaded recreation, cause disturbances to wildlife, and create other resource concerns. (Preliminary Issue identified in 2003 scoping)

5. Recreation Management

a. No special action, other than signs and clearing the trails of project debris, should be taken along the ATV trails and hiking trails. Many recreation people like to see the results of active forest management activities. (PFI-98)

6. Landownership and Special Designations

a. Management scheduled for area adjacent to Yeaney Development, where my camp is located. Too close to camps, can the area be buffered? (JS-98)

b. Too much activity planned for area around Yeaney Development. This activity combined with past activity would leave camps surrounded by cutover land. (FS-98)

7. Natural Resource Management

a. Forest fragmentation due to some forest management practices (clearcuts, forest openings, and possibly regeneration openings) leads to opportunities for cowbirds to parasitize songbird nests, resulting in declines of songbird populations. An alternative to manage this area for forest interior species (by changing its management prescription if needed) must be considered. Also, projects that reduce the fragmentation of the area should be considered. (HE-98)

b. These comments are concerning on the pine stand (Compartment 659, Stand 19) near the sewage treatment plant at the intersection of the Loleta Road with Millstone Creek. If the intent of thinning is to allow sunlight in for what will hopefully be regeneration to a thicker pine stand, why not forego the thinning and plant pine seedlings? … I feel there is no urgent need to change this EC (existing condition) to a DFC (desired future condition). … Thinning would also weaken the soil, and result in sedimentation of Millstone Creek, since roots of cut pines would die and weaken the grip on adjacent pines whose roots have grown together. The disturbance caused by logging activity would cause significant damage to the Millstone drainage which is trying to overcome the damage caused by a mismanaged sewage treatment plant. … Removing any of these pines will result in increased water temperature of the creek, and will increase the flow and sedimentation caused by runoff after it rains. I feel pine stands such as these, which have been managed with a "hands off" policy, and allowed to grow for the past 60 years, should remain to not only serve as a year round haven and harbor for wildlife, but serve as testimony to the wise management by you, the Forest Service. We do not have enough old growth stands of any type of forest, especially pine, and should seriously reconsider any plans to alter these from their natural state. (JW-98)

8. Social and Economic Impacts

No preliminary social and economic impacts issues were identified.

II. Non-Issues:

Non-issues include opinions, questions, information requests, and statements, which do not present a clear dispute with the proposed actions based on an anticipated effect.

1. Planning Process

a. Project has not had sufficient oversight and an EIS needs to be prepared. (MD-98)

Response: *An environmental assessment (EA) will be the basis for determining whether or not an environmental impact statement (EIS) will be accomplished.*

b. Because this Project is controversial, public meetings should be held before any alternative is decided upon. (ADP-98)

Response: *Comment noted. The responsible official has the option whether or not to hold hearings and open houses for each project based and determined by the level of interest among a broad segment of the public. The Marienville Ranger District conducted a public tour of the Brush Creek Project area on June 28, 2003.*

c. Without a prior knowledge of the stocking levels of stands in regeneration and previously established stands, where removal cuts have occurred, it is difficult to comment on the timber portion of the proposal. (EH-98)

Response: *This information is available at the Marienville Ranger District.*

d. The Forest Service needs to publish the results of the first 30 years (removal cuts started in the 1960s) of even-aged cutting on the Allegheny National Forest, emphasizing stocking levels or stocking percent. No reasonable comments or decisions can be made about the future management of the forest unless the managers know where they have been. Research probably has this data available now, and it only has to have a narrative written up prior to publication. (EH-98)

Response: *Information of this type is available in our yearly Forest monitoring and evaluation reports.*

e. Describe the location of Brush Creek Project Area in proximity to the East Side Project. (ADP-98)

Response: *The Brush Creek Project is located south of and adjacent to the East Side Project Area.*

f. Wildlife habitat improvements which include wildlife planting/fencing, pruning apple trees, regenerating aspen, and prescribed burning for planting preparation is planned for many acres in the Brush Creek Project area. Will these be implemented if there is no timber harvest? Will the costs of these improvements be accounted separately or with timber? Cost of timber sales attributed to environmental requirements; wildlife and recreational benefits must be accounted for separately to avoid the cry that timber sales "lose money." (RW-99)

Response: *Funding for the wildlife habitat improvements and recreation proposals would be determined prior to implementation. The cost of implementing the proposed wildlife and recreation work is not included in the timber appraisal, which determines the value of the timber to be sold. Receipts from the timber sale may be used to fund the porposed wildlife and recreation work. An economic analysis will be included in the environmental analysis.*

g. Here you tell us you are doing reforestation, what do you mean when you say forest? (JK-98)

Response: *According to <u>The Dictionary of Forestry</u>, a forest is an ecosystem characterized by more or less dense and extensive tree cover, often consisting of stands varying in characteristics such as species composition, structure, age classes, and associated processes, and commonly including meadows, streams, fish, and wildlife. On page A-9 of the Forest Plan, Forest Land is defined as land at least ten percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use.*

h. What do you mean when you say soil? (JK-98)

Response: *According to The Dictionary of Forestry, "soil" is defined as "the unconsolidated mineral or organic material on the immediate surface of the earth that serves as the natural medium for the growth of land plants."*

i. Please define "declining trees?" (ADP-98)

Response: *Declining trees are trees exhibiting a decrease in health and vigor caused by one or more biotic or abiotic factors.*

j. Please define "reforestation." (ADP-98)

Response: *According to The Dictionary of Forestry, "reforestation" is defined as "the reestablishment of forest cover either naturally or artificially – note reforestation usually maintains the same forest type and is done promptly after the previous stand or forest was removed."*

k. Please include a Definition of Terms with all future mailings. It seems that the US Forest Service continually attempts to introduce terms that have little meaning in an attempt to avoid being caught in litigation and exclude the public from meaningful participation. (ADP-98)

Response: *Request noted. A glossary of terms may be included in the environmental analysis. A glossary of terms is also included in the Forest Plan.*

2. Alternatives

a. An alternative must be developed to manage the area in a manner prescribed in HR 2789, the National Forest Protection and Restoration Act. (HE-98)

Response: *The respondent is referring to pending legislation in the House of Representatives. This legislation is not law and proposes ending commercial logging on National Forest Lands in favor of restoration projects.*

b. Please detail what makes up the total costs listed for each alternative. (ADP-98)

Response: *An economic analysis will be conducted as a part of the environmental assessment. A summary will be included in the environmental assessment and a detailed list of costs would be available in the project file.*

c. What criteria did you use to eliminate the Alternatives Considered but Eliminated from Detailed Study? (ADP-98)

Response: *Possible reasons to eliminate an Alternative from detailed study may include (1) legality, (2) failure to meet the purpose and need, (3) technologically infeasible, (4) clearly unreasonable, (5) duplication within the existing range of alternatives, (6) decision already made, (7) unreasonable environmental harm, (8) cannot be implemented, or (9) remote or speculative.*

3. Affected Environment

a. OGM operators get away with abusing FS land surface and polluting state waterways. (JS-98)

Response: *Approximately 93 percent of the subsurface mineral rights on the ANF are privately held and these mineral owners have legal rights to access their minerals. The Forest Service, as the surface owner, has also certain rights and works the mineral owners to minimize their impacts to the surface and to identify and correct problems associated with their developments.*

b. Road building, herbicides, ammonium nitrate additions, soil compaction, mechanical injury, fumes from equipment, removal of ecological stages one, two and three of trees, planting non-native grasses in this area, changing water patterns and putting up fences all add to the decline of forest health. Especially by means of depletion, disruption and dysfunction of the natural system which was once our fertile forest. (JK-98)

Response: *Effects of the proposed activities will be analyzed in the environmental assessment.*

c. By removing trees in the BRUSH CREEK PROJECT EIS future uprooting and churning, will be severely reduced. The uprooting of trees lifts and mixes soil of the once fertile forest, an important ecological process. In some areas soil churning by the woody roots of wind thrown trees retards development in the soil of impervious layers of mineral deposits, known as iron pan. Without these processes, standing pools of water would eventually produce swampy forest sites (Franklin, Shugart and Harmon, 1987, pg 551). (JK-03)

Response: *Effects of the proposed activities on soils will be analyzed in the environmental assessment.*

d. The federally endangered Indiana bat needs to be considered. The analysis needs to consider all available research and the Technical Draft of the Recovery Plan for the Indiana bat, which indicates that the project area is in the summer maternity range. The ESA requires the Forest Service to use "the best scientific and commercial data available" to fulfill its Section 7 obligations. The analysis needs to consider the summer habitat required by female Indiana bats for maternity roosts (e.g., roost trees, protection form disturbance, and foraging habitat). The analysis also needs to consider the summer roosting and foraging needs of male Indiana bats. The analysis on roosts needs to consider existing and potential roosts in upland and riparian areas and the issues of bats using the trees while the sale is being cut (which would result in their death by killing them when their roost is cut or being killed by an adjacent tree falling on them), loyalty to the roost trees, stress of finding new roosts, and the impacts of removing trees next to roosts or potential roosts (i.e., making the tree more susceptible to windthrow and changing the thermal dynamics). The analysis also needs to consider if there are any hibernacula in the area. If so, the analysis needs to consider the impacts of the sale on the bats' summer, fall, and winter habitat. The Forest Service also needs to consider the rulings in House v. United States Forest Service, 974 F. Supp. 1022 (E.D.Ky. 1997) and Bensman v. United States Forest Service, 984 F. Supp. 1242 (E.D.Mo. (1997)). These rulings specifically rejected all the Forest Service's standard claims about why the logging will not have any adverse effects on the Indiana bat and ruled that the timber sales in question will "take" the Indiana bat. (HE-98)

Response: *Effects of the proposed activities on the Indiana bat will be analyzed in the environmental assessment. The Indiana bat has not been found within or near the Brush Creek Project Area.*

e. The number of bat boxes placed within the project area should be increased dramatically. This area is very close to locations where the endangered Indiana bat has been identified. An increase in bat boxes may help to increase their numbers, even if it is not the preferred habitat. Secondly, the increase of bat boxes can provide for insect relief for those camping at Loleta. Buzzard swamp may produce billions of mosquitoes in one summer, and increasing the number of bats in the area may allow the number of recreational visitors in the area to increase as well. (KC-03)

Response: *Comment noted. The Indiana bat has not been found within or near the Brush Creek Project Area. According to our wildlife surveys, snags and other potential roost bat trees are common across the Brush Creek project area. However, we are proposing to place some bat boxes to supplement existing snags and other potential roosting habitat within the Brush Creek project area. Controlling mosquito populations around the Buzzard Swamp and Loleta Campground is beyond the scope of this project.*

f. The result is that site-specific actions are being designed to move towards a DFC that can in no way sustain viable populations of species that require large tracts of older growth forests for survival such as the Indiana bat and sensitive Northern long-eared bat. The Brush Creek Project proposed action unfortunately, is no exception. (ADP-03)

Response: *Effects of the proposed activities on the Indiana and northern long-eared bats will be analyzed in the environmental assessment. As noted previously, the Indiana bat has not been found within or near the Brush Creek project area.*

g. Many of the PETS species to be affected by the Brush Creek Project are sensitive to fragmentation. From the endangered Indiana bat to the sensitive (and state threatened) yellow-bellied flycatcher, PETS species require or at least prefer substantial amounts of unfragmented forests. The Brush Creek Project analysis needs to consider the effects of fragmentation on these species. (ADP-03)

Response: *Effects of the proposed activities on the PETS and Regional Forester's Sensitive Species will be analyzed in the environmental assessment. A fragmentation analysis will also be completed for the environmental assessment.*

h. PETS species on the Allegheny typically require contiguous tracts of older forests and/or high water quality. Of all cutting methods available to the Forest Service, even-aged management results in the least contiguous mature forests and the greatest impacts to water quality (through erosion and sedimentation). (ADP-03)

Response: *Effects of the proposed activities on the PETS species and water quality will be analyzed in the environmental assessment. A fragmentation analysis will also be completed for the environmental analysis.*

i. The continued implementation of even-aged management without careful consideration of alternative methods/projects is a violation of the NFMA's requirements to maintain viable populations of PETS species. (ADP-03)

Response: *Cumulative effects of the proposed activities on the PETS species will be analyzed in the environmental assessment. Alternative 3, which minimizes fragmentation, and proposes some uneven-aged management, was developed in response to concerns express by the public during scoping about fragmentation.*

j. Please note the state endangered plant species *Salix subsericea* is known to exist in this area around Marienville. All work that would affect the habitat (meadows and swales) or the plant itself should first be directed to the above address. If you would like, we could provide a map of the specific areas in which the plant exists so that impact may be avoided. (JN-03)

Response: *The Marienville Ranger District is in receipt of a map provided by the respondent and will comply with the request for information and collaboration.*

k. Will timber harvesting contribute or take away from the objective to "protect, restore, or improve riparian and high quality cold water fishery habitat" listed under the Needs for the Project? (ADP-98)

Response: *Effects of proposed activities to riparian areas will be completed and will include appropriate mitigation measures and design features, including buffers, to protect riparian areas.*

l. Please use an Ecological Land Type chart that you demonstrated in the North Fork Chapel EA on page III-5. Please document the management activities that should not take place in the various Topographic Position, Soil Group, and Soil Characteristic categories. (ADP-98)

Response: *Request noted. Information on the types of management activities that should not take place on various topographic positions, soil groups, etc. is available in county soil surveys.*

m. Ban any aerial spraying of herbicides and fertilizers as special concerns and/or areas to avoid during treatment, including unique and uncommon plant communities will be difficult if not impossible to avoid due to the inaccuracy of the spraying. (ADP-98)

Response: *No aerial spraying of herbicides or fertilizer is planned with this project.*

n. Caves and springs many miles away can be adversely affected by logging 20 or more miles away and in different watersheds. For example, a timber sale could result in increased water entering a cave and in a major storm event, the increased water could result in a flood large enough to kill (i.e., drown) or harm creatures (including humans) in the cave. Harm could be caused by changes in water temperature or increasing sediment. (HE-99)

Response: *The effects of the proposed activities on springs and other riparian areas will be analyzed in the environmental assessment. There are no known caves within the Brush Creek project area.*

4. Vegetation Management

a. Forest Service research indicates dead and decaying wood accounts for 25 percent of a forest's biodiversity. The impacts of removing trees on this component of the forest ecosystem need to be considered. The Forest Service generally contends that trees are

somehow wasted when they die. If the trees die, they need to be allowed to fulfill their function and be recycled back into the ecosystem. The no action alternative needs to consider these values. (HE-98)

Response: *Effects of the proposed activities will be analyzed in the environmental assessment. An adequate supply of snags and potential den trees will be retained in timber harvest units to provide habitat for those species that nest in cavities, forage on dead and dying trees, and rely on course woody material on the forest floor.*

b. Logging is removing present and future available moist microhabitats, primarily because of a lack of large logs in intermediate and advanced stages of decay. Aubry et al. (1988) found that some species of salamander were most abundant around CWD. Dupuis (1993) concluded that salamander populations in logged areas were limited by available moist microhabitats, primarily because of a lack of large logs in intermediate and advanced stages of decay (Voller and Harrison, 1998). Note there are salamander species on T&E list. (JK-03)

Response: *Effects of the proposed activities will be analyzed in the environmental assessment. No salamanders on the T&E list have been inventoried on the ANF.*

c. The Forest Service may have to include a disclaimer that the Forest Service cannot guarantee future quality, volume, nor value due to the problems associated with overbrowsing, which is causing reduced stocking levels in hardwood stands. Disclaimers are used all the time. The Forest Service cannot guarantee 100 percent stocking, and this should be brought out. (EH-98)

Response: *Comment noted.*

d. Due to the high value of the forest products produced on the National Forest and the risks inherent with timber management on the forest, I recommend initiating a more intensive stocking survey. Currently, I believe you are using a sampling regime which explains about 75 percent of the variation in the sample, and I recommend increasing the intensity of the survey to a level which explains 90 percent of stand variation. This point is especially salient when you consider the overbrowsed and clumpy nature of the stands you manage. (EH-98)

Response: *Comment noted. This is beyond the scope of this project.*

e. Are there no stands in this project area that meet the old growth standards for MA 3.0 and MA 6.1? What is being done to correct this? (ADP-98)

Response: *Only 34 acres within the BCPA are currently over 110 years old. However, approximately 464 acres (7%) of MA 3.0 and 83 acres (3%) of MA 6.1 within the BCPA have been previously designated as old growth. This statement is a non-issue because it does not present a clear dispute with the proposed action. An environmental analysis will be completed.*

f. Designate some stands in this project area as future old growth to begin to rectify the current lack of any old growth in the Brush Creek Project Area. (ADP-98)

Response: *Please see above response to comment 4e.*

g. You state that the Forest Plan calls for providing 3-10 percent of the acreage in MA 3.0 to be maintained in permanent openings or other kinds of brood habitat. Currently the project area provides approximately 7 percent. With the estimated 6 percent of even-aged cuts that do not regenerate and turn into permanent openings, are you going to exceed the Forest Plan recommendations? (ADP-98)

Response: *According to district records, there is currently approximately 215 acres of permanent openings (3.5%) within MA 3.0 in the Brush Creek project area. Temporary openings would be created on approximately 534 acres (or about 9 percent) of MA 3.0 within the Brush Creek project area with implementation of the 2006 Proposed Action. If six percent of the temporary openings failed to regenerate and turn into "permanent openings", this would be an additional 32 acres (or 0.5 percent) of permanent openings in MA 3.0 in the Brush Creek project area.*

5. Transportation Management

a. ….pertaining to the 7.7 miles of new road construction; after project completion, all new construction should be replanted with trees and shrubs, etc., not just seeded. (FC-98)

Response: *The new roads would be needed for future management of the ANF. Trees and shrubs may be planted on roads that are being decommissioned (no longer needed), but not roads that are needed for management of the ANF.*

b. Why are you spending money to obliterate Forest Roads 166 and 767 as long as they are already there? (PFI-98)

Response: *No obliteration is planned for FR166. The beginning of FR767 is being relocated using existing corridors in order to avoid riparian areas.*

c. Provide a schedule as to what roads will be kept open permanently and what roads are being temporarily opened in this project area. (ADP-98)

Response: *Road Management Classifications (Open, Closed, and Restricted) for the BCPA are shown in the Brush Creek RAP (current) and will be listed in the environmental analysis for each alternative. A list of roads opened for hunting is available from our district offices annually prior to and during the hunting seasons.*

d. What are the road density guidelines under the Forest Plan for this project area? (ADP-98)

Response: *Road densities for Forest Roads in the BC RAP area are within the guidelines for Management Areas 1.0 (1 to 3 miles/square mile), 3.0 (2 to 4 miles/square mile), 6.1 (1 to 3 miles/square mile), and 6.3 (no guidelines) as shown in the Forest Plan.*

e. The road obliteration is a waste of resources. The roads scheduled for obliteration are currently stabilized against erosion and should be left that way. Vehicle barriers should be constructed where appropriate and the remaining road surface should be left intact. (BF-98, PF-98, MF-98)

Response: *Comment noted.*

f. Road 379 past the junction with 379A should not be reconstructed if no harvesting use of the road is being planned. (BF-98, PF-98, MF-98)

Response: *Reconstruction of this segment of Forest Road 379 has been dropped from the proposed action.*

h. The new road construction off of 226 does not appear to be necessary, an off road landing should be used instead. (BF-98, PF-98, MF-98)

Response: *With redesign of the project, this segment of road has been dropped from the proposed action and the project area.*

i. The new road construction off of 591 to access the conifer stand should be deleted. A main skid trail will service this area better. (BF-98, PF-98, MF-98)

Response: *Construction of this segment of forest road has been dropped from the proposed action.*

j. The last quarter mile of 166D appears to be unnecessary. (BF-98, PF-98, MF-98)

Response: *Construction of this segment of Forest Road 166D has been dropped from the proposed action.*

6. Recreation Management

a. More recreational opportunities, including motorized trails, needed on the ANF. (JS-98)

Response: *This is beyond the scope of this project. No new motorized trails are being proposed within this project.*

7. Landownership and Special Designations

a. Old railroad grades are not shown on the scoping letter map, although, they should be listed on an archaeology map located in the office. These grades, either in part or in their entirety, deserve protection from skidding and temporary road developments. (EH-98)

Response: *On the ANF, old railroad grades are protected if warranted.*

8. Natural Resource Management

a. Does an improvement cut favor the species currently dominant in the forest or the species that were historically (before 1890) dominant in the forest? (ADP-98)

Response: *The purpose of an improvement cut is to remove less desirable trees of <u>any</u> species in a stand of poles or larger trees, primarily to improve composition and quality.*

b. The high biodiversity of Millstone Creek watershed is directly attributable to its high density of unroaded areas – a fact that reflects the low density of logging and drilling sites compared to other parts of the Allegheny. Yet, what we have proposed here is a silly, single-minded approach to forest management which proposes the use of clearcutting and other forms of even-aged logging with the sole beneficiary being the timber corporations that export the timber and ruin our local economy. (ADP-03)

Response: *Comment noted. The effects of the proposed even-aged harvest will be analyzed in the environmental assessment.*

c. How do you determine high quality timber, what process is used? Please provide data. (JK-98)

Response: *High Quality Hardwoods are defined on page A-11 of the Forest Plan as hardwood trees or stands that will yield high-value timber products such as face veneer, knot-free lumber, furniture or specialty product stock and flooring.*

9. Social and Economic Impacts

No non-issue comments were included in this analysis.

III. Alternatives Suggested by the Public

1. **Zero Cut/No Logging** (HE-98)
2. **Restore Pre-settlement Forest Conditions** (ADP-98, FORM01-03)
3. **Recreation Only Alternative** The Forest Service should implement plans that improve recreation opportunities. This would include an improved trail system, which would link the Loleta and Buzzard Swamp Trails. (FORM01-03)
4. **Exclusive Use of Uneven-aged Management** (EG-98, HE-98, and KJ-03)
5. **Manage for Forest Interior Species and Fragmentation Reduction** (HE-98) (ADP-98)
6. **No Herbicide Treatments** (JK-03)

IV. Significant and Non-Significant Issues

Significant issues are used to formulate alternatives, prescribe mitigation measures, or analyze environmental effects. Issues are "significant" because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflicts.

Issues determined to be non-significant are not used in the environmental analysis. Reasons that an issue is not considered significant may include:

- The issue is outside the scope of the proposed action.
- The issue is already decided by law, regulation, Forest Plan, or other higher level decision.
- The issue is irrelevant to the decision to be made.
- The issue is conjectural and not supported by factual evidence.

Significant Issues:

1. **Impacts of road management changes for access and resource protection**

   There is concern that road construction and and stone pit development/expansion and associated timber harvests would negatively impact soils, water, wildlife species, and opportunities for solitude within the project area. Some people want more roads

decommissioned and less access to enhance remoteness and opportunities for solitude within the project area, as well as minimizing the disturbances (including disturbances to wildlife) associated with motorized vehicles. (MD-98, EG-98, EDZ-03, KC-03, FC-98, BF-98, PF-98, MF-98)) (Preliminary Issues 4a, 4b, 4c, 4d, 4f, and 4g)

2. **Impacts of proposed activities on unroaded areas, habitat connectivity, and fragmentation within the project area.**

   There is concern that road building and timber harvesting would result in increased fragmentation and reduced habitat connectivity within the project area and this would result in negative impacts to wildlife, including interior songbirds. There are concerns that new road construction would impact the unroaded areas (>500 acres) identified in the Forest Roads Analysis. (HE-98) (Preliminary Issue 7a)

3. **Impacts to Yeaney Development.**

   Private landowners within this development have concerns about the level of timber harvesting and other proposed activities near their camps. They are concerned that the proposed activities combined with past activities would leave their camps surrounded by cutover land. (JS-98, FS-98) (Preliminary Issues 6a and 6b)

Non-Significant Issues:

1. **Affected Environment**

   a. The Forest Service must not attempt to use "patch clearcutting" in place of "group selection." (HE-98) (Preliminary Issue 2a)

   Response: *This issue is considered non-significant because it is beyond the scope of this project. No patch clearcutting is being proposed with this project.*

   b. No harvesting should be done on slopes greater than 15 percent due to erosion problems. (ADP-98) (Preliminary Issue 2b)

   Response: *This issue is considered non-significant because it is conjectural and not supported by factual information.*

   c. Potential for a shallow water impoundment for waterfowl exists on Millstone Creek. This area, identified on the scoping letter map as Compartment 674, south of Forest Road 226, is treeless with huge and ancient stumps. (EH-98) (Preliminary Issue 2c)

   Response: *This issue is considered non-significant because it is beyond the scope of this project. With redesign of the project, compartment 674 was dropped from the project area.*

   d. I suggest eliminating the 1,354 acres of herbicide application as a way of maintaining soil and water quality. (KJ-03) (Preliminary Issue 2d)

   Response: *This issue is considered non-significant because it is conjectural and not supported by factual information. The use of herbicides to aid in reforestation is a common practice on the ANF. The potential affect of herbicide on water quality was evaluated during the summer of 2002. Herbicide was applied within a harvessted unit*

on the Bradford Ranger District adjacent to Root Run, a perennial stream channel. Forest Plan streamside buffers were implemented and water samples were taken from the stream following the herbicide application. No detectable amounts of herbicide were found in the water samples collected. Although it is likely that the herbicide moves no more than a few inches within the soil and binds tightly to soils, streamside buffers are important to mitigate any drift in the air that may occur during application and filter any runoff that may occur during storm events.

The use of herbicides for understory vegetation treatment has been analyzed in the Forest Plan and the Final Environmental Impact Statement for Understory Vegetation Management (USDA-FS 1991, Chapter 2, pp 3 to 6) and concluded that they are the most effective and least costly and meet soil, water, health, and safety criteria. The effects of no herbicide treatments will be analyzed under the no action alternative.

2. **Vegetation Management**

a. The larger of the two-aged areas appears to be stocked with smaller timber and harvesting should be deferred. In the other areas marked for two-aged management, the treatment may be appropriate. (BF-98, PF-98, and MF-98) (Preliminary Issue 3a)

Response: *This issue is considered non-significant because it is beyond the scope of the project. With redesign of the project, these two stands are no longer being proposed for two-aged harvests.*

3. Transportation Management

e. Road segment 787 does not need reconstruction, an off road landing could be built instead. (BF-98, PF-98, MF-98) (Preliminary Issue 4e)

Response: *This issue is considered non-significant because it is already decided by Forest Plan direction. Because of safety and visual concerns, the log landing is being proposed along Forest Road 787, instead of State Route 3002.*

4. Recreation Management

a. No special action, other than signs and clearing the trails of project debris, should be taken along the ATV trails and hiking trails. Many recreation people like to see the results of active forest management activities. (PFI-98) (Preliminary Issue 5a)

Response: *This issue was considered non-significant because it is beyond the scope of this project. There are no designated ATV trails within the project area and no timber harvesting proposed along any hiking trails within the project area.*

5. Natural Resource Management

a. There was concern about proposed activities in the pine stand (Compartment 659, Stand 19) near the sewage treatment plant at the intersection of the Loleta Road with Millstone Creek. (JW-98) (Preliminary Issue 7b)

Response: *This issue was considered non-significant because it is beyond the scope of this project. With redesign of the project, stand 19 has been dropped from the proposed action.*

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Appendix B—Monitoring Plan for Mitigation Measures

Mitigation measures are designed to protect the physical, biological, and social environments within the BCPA. Mitigation measures are necessary when a specific situation requires Forest Plan standards and guidelines be exceeded to avoid potentially significant effects. The following mitigation measures are to be implemented in the BCP. References are included in parentheses for each mitigation measure. Monitoring is designed to ensure that mitigation measures are being implemented as part of the project activities. The monitoring activities below are in addition to those listed in the Forest Plan.

Table B-32. Mitigation Measures and Monitoring Plan

MITIGATION MEASURE	MONITORING PLAN
Soils and Hydrology	
There will be no skidding and movement of machinery through spring seeps and stream channels. Skid trails and landings will be located away from the head of any seep. Appropriate erosion control methods will be implemented to minimize movement of silt into any seep. *Why Mitigation Works: Pennsylvania BMPs. (Chunko 2001, PA DEP 2005b, USDA-FS 2001a)*	**This mitigation measure will be included in the herbicide and timber sale contracts for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**
On Group 2 soils, main skid trails should occupy less than 10 percent of the stand. Existing main skid trails should be used whenever possible to reduce additional impacts. *Why Mitigation Works: Pennsylvania BMPs. (Chunko 2001, PA DEP 2005b, USDA-FS 2001a)*	**This mitigation measure will be included in the timber sale contract for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**
For stands where inclusions of wet soils (drainage Group 2 or 3) are found, the following shall apply: 1) All heavy equipment (including feller-bunchers) will be excluded from wet soils inclusions less than 1 acre; 2) Main skid trails should be kept out of wet soil inclusions > 1 acre whenever possible. The stand-level measures identified above will apply where skid trails must be located within wet soil inclusions. *Why Mitigation Works: Pennsylvania BMPs. (Chunko 2001, PA DEP 2005b, USDA-FS 2001a)*	**This mitigation measure will be included in the timber sale contract for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**

MITIGATION MEASURE	MONITORING PLAN
Trees should not be removed within 100 feet of the high water mark of vernal pools, except for facility, trail, and road maintenance. Heavy equipment operation should be excluded within 100 feet of vernal pools. From 100 to 200 feet, maintain at least an average of 50 percent canopy cover to protect amphibian habitat. Heavy equipment use should utilize low ground pressure (less than 15 psi loaded contact pressure with zero inches of penetration) and occur during proper site conditions (dry or frozen) within 100 to 200 feet of vernal pools. Heavy equipment restrictions do not apply to facility, trail, and road maintenance or stream crossing construction, but impacts to riparian areas should be minimized or rehabilitated. *Why Mitigation Works: Pennsylvania BMPs. (USDA-FS 2001, p 4-22, Chunko 2001, PA DEP 2005b)*	**This mitigation measure will be included in the timber sale contract for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**
Road drainage outlets will be designed to a standard that prevents accelerated erosion on all roads proposed for construction or maintenance. *Why Mitigation Works: Pennsylvania BMPs.* (*PA DEP 2000*)	**This mitigation measure will be included in the road maintenance contract for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**
Vegetation	
Retain scale-free or lightly infested beech to provide for mast and snag recruitment. Healthy beech should have full, healthy crowns, tight smooth bark, and no rot or cavities. They should not exhibit any scale (or only have light scale present), fungus, crown dieback, tarry spots, or puckered bark. *Why Mitigation Works: These trees may be genetically resistant. Pennsylvania BMPs. (PA DEP 2001, Burns and Houston 1987; Mielke and others 1986)*	**The general marking guidelines and/or individual silvicultural prescriptions will include this mitigation. Marking Quality Compliance Checks are completed for each sale to ensure that stands are marked according to silvicultural prescriptions.**

MITIGATION MEASURE	MONITORING PLAN
NNIS	
In order to reduce the occurrence of NNIS and minimize the risk of spread into other areas, areas of infestation will be mapped and on sites where infestation has been documented equipment used in timber harvesting or reforestation activities will be cleaned prior to the arrival and upon departure of all treatment areas. *Why Mitigation Works: Washing equipment before it leaves an area prevents transporting seeds and spores. Seeds and spores are found in vegetation, dirt, and mud clinging to the undercarriage and underbody parts. Cleaning focuses on these areas (USDA-FS 2005c).*	**This mitigation measure will be included in the herbicide, fence-building, and timber sale contracts for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**
Wildlife	
Site preparation and non-commercial release cuts would be conducted outside the period of April 1 to June 30, to avoid possible impacts to nesting songbirds. *Why Mitigation Works: This mitigation will help avoid impacts to nesting songbirds during the nesting season. (Pennsylvania Breeding Bird Atlas 2006)*	**This mitigation measure will be included in the site preparation and release contracts for this project and contract inspections will be conducted to ensure that this mitigation measure is being implemented on-site.**

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Appendix C--Forest Service Response to 2006 Scoping and 30-Day Comments

The Forest Service solicited comments from the public and other organizations on the Brush Creek Project. The Forest Service asked for comments to be as specific as possible and to address either the adequacy of the document, the merits of the alternatives discussed, or both (40CFR1503.3(a)).

This appendix presents the public comments received during the Brush Creek Project 30-day comment period. Each letter is divided into individual comments followed by the Forest Service response. During the 30-day comment period, four comment letters (including emails) were received from individuals or organizations.

Possible responses to comments are to:

1) Modify alternatives including the proposed action.
2) Develop and evaluate alternatives not previously given serious consideration by the agency.
3) Supplement, improve, or modify its analyses.
4) Make factual corrections.
5) Explain why the comments do not warrant further agency response, citing sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response.

Comments were analyzed for site specificity to the Brush Creek Project. Some comments were judged to be beyond the scope of the project, because they addressed broader issues than the implementation of activities proposed in the Brush Creek Project documents. Examples of such comments addressing broader issues include the comment: "I don't like logging on the National Forests" (a national-level issue) or "I don't want logging on the Allegheny National Forest" (a national/Forest-level issue). A comment such as "I don't think you should cut unit ___ because there is critical habitat there," would be an example of a site-specific comment to the Brush Creek Project. Some comments were opinions and not specific comments about the proposed activities or the adequacy of the document, such as "I do (don't) support road building." Some comments provided were not comments at all, but simply quotations from other sources. As noted in the comment responses, most responses point to where the comment was addressed in the documents, some required a correction to the document (and were so noted), and some were beyond the scope of the Brush Creek Project.

Twenty-four comment letters/emails were received during the 2006 scoping and 30-day comment periods. Individual comments are identified by the number of the letter and the corresponding comment number within that letter. For example, the sixth comment derived from the second letter would be labeled "Comment 2-6".

The Forest Service response follows each comment and is presented in italic type. For example:

Comment 5-7
You need to provide an alternative that returns the project area to pre-clearcut conditions.

Response: *See Chapter 2- Alternatives considered But Eliminated from Detailed Study.*

No new information was received that either brought forward new issues or would cause a change in the analysis for the Brush Creek Project. All comments received during the 30-day comment period are located in the Brush Creek project file. The analysis of the content and disposition of these comments is also located in the Brush Creek project file.

Table 1. Comments Received From the Public during the 30-Day Comment Period

Letter Number	Commenter Name/Organization	Type
1	Heartwood[1] (submitted by Jim Bensman)	Email
2	Mark Banker	Email
3	Dale Anderson (PFIA)	Email
4	Jack Hedlund (Allegheny Forest Alliance)	Email
5	Stephen Peterson	Email
6	Lisa Rae Vaughan	Email
7	B. Sachau	Email
8	Devin Ceartas	Email
9	Jack Hedlund (Allegheny Forest Alliance)	Email
10	Allegheny Defense Project (submitted by James Kleissler)	Email
11	Rick Mauk	Email
12	Mark Donham	Email
13	Sarah Roush	Email
14	Carol Showalter	Email
15	Beth Raps	Email
16	Aramie Bloom	Email
17	Dave Spencer	Email
18	Robin Bardun	Email
19	Mary Eileen Rice	Email
20	Shawn Waggener	Email
21	Larry Gaudreau	Email
22	Paula Worley	Email
23	Jack Hedlund (Allegheny Forest Alliance)	Email
24	Eusebius Ballentine	Email

[1] The comments received from Heartwood for this project are the exact same comments as those received for a previous project, the Trail's End Re-Entry Environmental Assessment (EA), except for one new comment, for which a response is provided below. The responses to Heartwood's comments in the Trail's End Re-Entry EA are located in the Project File. Comments include public opinion, scientists call for end to logging National Forests, need for timber sale, biodiversity and forest fragmentation, secondary impacts, impacts on plant and animals in the sale area, Migratory Bird Treaty Act, baseline data, physical environment, fire danger, exotic species, caves, springs, and groundwater, roads, invertebrates and micro organisms, dead and decaying wood, fish and wildlife, bats, unique plant communities, timber theft, recreation, economics, graphics, even-aged management, and Indiana bat (USDA-FS 2004). Most of their concerns were addressed in the analysis for the EA.

Comments Received During the 30-Day Comment Period and Responses

Letter 1
Letter 1 (email with attachment) was identical to the public comment for the Trail's End Re-Entry Environmental Assessment, with two exceptions. The respondent structured the beginning to the letter differently and omitted a request to not receive a printed copy of the EA. One new comment was included.

Comment 1-1
We also object to the failure to prepare an EIS.

Response: *An environmental assessment (EA) will be the basis for determining whether or not an environmental impact statement (EIS) will be accomplished.*

Letter 2
This letter (email) was a thank you for being sent the availability notice for the Brush Creek Public Comment Package on the ANF website.

Letter 3
This letter (email) provided conditional support for the Brush Creek Project and management practices of the Forest Service.

Comment 3-1
What are the "changes in forest priorities" as mentioned in the first paragraph of page A-1? I do not recall that the forest plan has changed since 1996.

Response: *The "changes in forest priorities" relates to changes in the priority of projects to be completed on the district or forest.*

Comment 3-2
We at PFIA support your selection of alternative 3 because it will increase the net cash flow to the US government by $4,615,921 more than alternative 4, and about $9,994.084 more than the no action alternative or alternative 1.

Response: *Comment noted.*

Comment 3-3
Another reason we support alternative 3 is the additional acres of early successional habitat. The ANF has not met its 1986 plan to create early successional habitat. Alternative 3 will do more to move the ANF towards the 1986 target of early succesional habitat than will alternative 4. It will also help balance the timber age classes.

Response: *Comment noted.*

Comment 3-4
The arguments in favor of reducing roads and fragmentation in support of alternative 4 are arbitrary and capricious.

Response: *Comment noted.*

Comment 3-5
Page 15 notes five levels of decommissioning roads. What level will be used on the 3 miles in the BCPA?

Response: *A road can be decommissioned by applying one or more of the following treatments: 1) Blocking entrance to a road and installing waterbars* ***(Block)****; 2) Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation* ***(Re-Vegetate)****; 3) Removing culverts, reestablishing drainageways, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed* ***(Removal)****; 4) Completely eliminating the roadbed by restoring natural contours and slopes* ***(Re-contour)****; or 5) Other methods designed to meet specific conditions associated with the unneeded roads* ***(Other)****. Block is being proposed for all the road segments proposed for decommissioning in the BCPA.*

The section of FR760 proposed for decommissioning is to be ***blocked****. The southern section of FR767 proposed for decommissioning is proposed to be* ***blocked*** *and* ***re-vegetated****. The remaining sections of road proposed for decommissioning would be* ***blocked****,* ***re-vegetated****,* ***removed*** *(culverts), and* ***re-contoured.***

Comment 3-6
In general, we oppose the removal of roads. These roads can be gated and "put to bed" so they are in place for future activities. Roads are capital improvements that have been paid for by the taxpayers. We do not believe it is in our best interest to spend government money to destroy a capital asset.

Response: *Comment noted.*

Comment 3-7
There is good chance that your predictions about cost and amount of fencing and other reforestation activities are too high. Due to the reduction in the deer population, the cost of and the amount of reforestation activities as presented in the BCP public comment package could be reduced, based on evidence in the field as the project goes forward.

Response: *Comment noted. Refer to Chapter 4, Section 4.3.4 - Economics in the EA. The purpose of the economic analysis in the EA is to compare the relative costs/benefits of the alternatives considered in detail. It should not be interpreted as actual yield or losses or as an attempt to analyze all resource values.*

Comment 3-8
In summary we support alternative 3 with the above mentioned modifications. It comes closer to preserving the customs, culture, and the economy than the no action alternative 1, and alternative 4.

Response: *Comment noted.*

Letter 4
This letter (email) express interest in the project and asked for the Brush Creek Public Comment Package to be sent to the respondent on a CD. The email was received on October 31, 2006 and the CD was sent on November 1, 2006.

Letter 5

Comment 5-1
I urge you to reconsider and withdraw the Brush Creek Timber Sale with plans to construct roads and conduct clear cut logging activities within three Allegheny National Forest roadless areas.

Response: *There are no roadless areas within the BCPA. There are three "unroaded areas" – McCray Run (1261 acres), Lick Run (1098 acres), and WB Millstone (601 acres) – in the BCPA. None of the unroaded areas are of sufficient size to meet the requirements for inclusion in the formal roadless inventory nor do they meet any of the other criteria necessary for inclusion in this inventory (FSH 1909.12) (USDA-FS 2006d, Appendix C).*

The areas referred to in this comment are described in the Forest-Wide Roads Analysis (USDA-FS 2003) as "unroaded areas", or areas that do not contain or are not otherwise influenced by Forest Service classified roads. These are areas "distinct from and not overlapping inventoried roadless areas".

The need to identify and analyze "unroaded areas" was first described in a 2001 Forest Service Interim Directive addressing road management activities. The need to identify and analyze such areas was later discontinued by a 2003 Amendment to the Forest Service Directive System, which dropped all reference to "unroaded areas". The discontinued use of this term was addressed in the Brush Creek Public Comment Package (USDA-FS 2006e, p.53) and is addressed in the Brush Creek EA (p. 53).

Despite the discontinued use of "unroaded areas" by the Forest Service, the potential effects to "unroaded areas" are addressed in the Brush Creek EA because these areas are described in the Forest-Wide Roads Analysis and the Brush Creek Roads Analysis. Concern about effects to "unroaded areas" was identified as a significant issue during scoping of Alternative 2 in 2003, and this concern was used to help develop Alternative 4 in the Brush Creek EA (pp. 18, 19 and 21), which does not propose any road construction (new corridors) and does not affect the size of any of the three "unroaded areas" in the BCPA.

Comment 5-2

These plans will seriously impact the Millstone Creek Watershed, which is a truly high value nature are that should be preserved without disruption.

Response: *Effects to water resources and riparian areas are described in Section 4.1.2 of the EA. In summary, streams and wetlands would be buffered from activities to prevent direct and indirect effects. Riparian buffers are designed to provide adequate filtering of sediment, herbicide, and fertilizer, to protect water temperature, and to allow for large coarse woody debris recruitment.*

With implementation of either action alternative, changes to streamflow and water quality within the East Branch Millstone Creek and West Branch Millstone Creek subwatersheds are expected to be minimal.

Because they would be implemented following Forest Plan standards and guidelines, mitigation measures, and/or design features, the amount of proposed road construction (on new or existing corridors) would not have cumulative significant effect to water resources in the two subwatersheds over the next two decades. Proposed road maintenance and decommissioning are expected to have a positive effect on water quality within these two subwatersheds. Any road construction for new OGM developments is expected to follow Pennsylvania Best Management Practices, which provide guidelines to minimize the effect of OGM development to water resources.

Letter 6

Comment 6-1
As a homeowner in Forest County who enjoys the quiet of the forest, and all of its non-invasive recreational activities (fishing, camping, biking) I request that you abandon plans to clearcut and construct roads within the Millstone Creek watersheds, including its roadless areas.

Response: *Please see responses to comments 5-1 and 5-2.*

Letter 7

Comment 7-1
We want the … administration to stop destroying America.

Response: *Comment noted. This is beyond the scope of this project.*

Comment 7-2
We want the … administration to stop causing global warming.

Response: *Comment noted. This is beyond the scope of this project.*

Comment 7-3
We want no more roads, there are already far too many roads destroying habitats for birds and wildlife and causing their deaths.

Response: *Comment noted. Effects to wildlife from proposed road activities are described in Section 4.2.3 of the EA.*

Comment 7-4
More roads also bring in more exotic invasives that need management to destroy them because they are not native plants – what a stupid idea to bring in more roads to do that.

Response: *Comment noted. Effects to non-native invasive species from proposed road activities are described in Section 4.2.2 of the EA.*

Comment 7-5
I also oppose all the logging going …. This idea of more logging in Allegheny is disgusting and perverted.

Response: *Comment noted. This is beyond the scope of this project.*

Comment 7-6
As an example do you know that only 4% of all the redwoods are left in the U.S. What is going on with our politicians allowing the destruction of lands that national taxpayers are paying taxes to preserve is absolutely insane?

Response: *Comment noted. This is beyond the scope of this project.*

Comment 7-7
Defend Allegheny National Forest Roadless Areas!

Response: *Please see the response to comment 5-1.*

Comment 7-8
The roadless forest scheduled for clearcutting and road building is considered important by conservationists because of its contribution to the high quality of the biologically diverse

Millstone Creek watershed…The Millstone Creek watershed has been recognized for protection due to its high conservation value…Conservationist say that the value of the Millstone Creek watershed for recreation, wildlife, and stream biodiversity is related to its unusually high density of roadless forest.

Response: *Please see the response to comment 5-2. Effects to wildlife and recreation from the proposed activities are described in Sections 4.2.3 and 4.3.3, respectively.*

Letter 8

Letter 8 did not contain any comments.

Letter 9

Letter 9 did not contain any site-specific comments.

Letter 10

Comment 10-1
The Forest Service must prepare an EIS for the Brush Creek Project. If approved, the Brush Creek Project could result in over 1,200 acres of even-aged logging in an area documented to have high water quality and the highest density of unroaded forest areas in the Allegheny National Forest. We have significant concerns regarding the Brush Creek Project that are either inadequately addressed in the EA or are not addressed at all.

The Brush Creek Project is a major federal action for several reasons. First, the project calls for over 1,200 acres of logging and nearly 1,000 acres of herbicide spraying. This alone should compel the Forest Service to prepare an EIS. But there are other factors as well that make it clear that a full-blown EIS must be prepared to adequately assess the impacts of the proposed action.

Response: *Please see response to comment 1-1.*

Comment 10-2
Three unroaded areas (URA) are located within the Brush Creek Project area. The McCray Run URA is 1,261 acres. The Forest Service states in the EA that "slight impacts to its size are not expected to change [McCray Run's] score and unroaded recreation opportunities would continue." This is a conclusory statement, which is particularly unacceptable when considering such limited resources as unroaded areas. To say it is troubling to see the Forest Service casually brush off constructing new roads into unroaded areas would be an understatement. The Forest Service has a duty and an obligation to protect these ever-shrinking unroaded forest areas. More importantly, though, is that we strongly disagree with the Forest Service's contention that there would just be "slight impacts to its size." Under Alternative 3, the McCray Run URA would be reduced from 1,261 acres to 965 acres, a reduction of nearly 25%. A 25% reduction in the size of an unroaded area is anything but "slight."

Response: *Please see response to comment 5-1. The effects to unroaded areas are discussed in Chapter 4, Section 4.1.3 of the EA.*

Comment 10-3
The Lick Run URA is 1,098 acres. The Forest Service identified three years ago that the Lick Run URA was one of the few unroaded areas in the Allegheny that actually had the potential to expand. In the Brush Creek EA, however, this fact is not even mentioned in the transportation section. What the Forest Service does disclose is that under Alternative 3, "meaningful changes

to [Lick Run's] size and configuration are expected to reduce its score to below average." Under Alternative 3, the Lick Run URA would be reduced from 1,098 acres to 667 acres, a 40% reduction. It follows, then, that the expansion potential for this unroaded area would likely be eliminated. This is but yet another example of an agency with misplaced priorities. The Forest Service should have considered in one of the alternatives the possibility of expanding this unroaded area. This is a reasonable consideration given the Forest Service's previous recognition of the potential for expanding the Lick Run URA.

Response: *Please see response to comment 5-1. The effects to unroaded areas are discussed in Chapter 4, Section 4.1.3 of the EA.*

Comment 10-4

The West Branch Millstone URA is 601 acres. The Forest Service practically discards this URA because it "did not score high on its evaluation." Therefore, "no meaningful impacts would result." Again, this is a conclusory statement that has no bearing in reality. The Forest Service tends to believe that because the impacts to the size of this URA are small, there will not be any meaningful impacts. However, the quarter mile of new road planned for this area could have a significant impact. 601 acres is not that large an area. The Wilderness Act requires 5,000 acres, with some exceptions, for areas to provide the necessary solitude for Wilderness designation purposes. Even at that size, roads on the perimeter of Wilderness Areas are known to have audible effects. So it does not take a genius to figure out that a quarter mile of road in an area of only 601 acres could and most likely will have dramatic effects. Furthermore, the size of this unroaded area would be reduced to 506 acres, a reduction of 16%. So the effects of the planned activities would have even greater effects than the Forest Service is admitting.

Response: *Please see response to comment 5-1. The effects to unroaded areas are discussed in Chapter 4, Section 4.1.3 of the EA.*

Comment 10-5

The Forest Service seemed to ignore the wildlife indices for these unroaded areas. The EA talks about how recreation opportunities and solitude will still be provided (though we disagree). But there is really no mention that these areas scored highest when it came to providing good habitat. This is woefully inadequate. Given that all three URA's would be reduced in size and that the Forest Service did not appear to fully consider the value of these areas, it would be inappropriate to issue a FONSI because it is clear that an EIS must be prepared to more fully account for the unique resources in the Brush Creek Project area.

Response: *Please see response to comment 5-1. The effects to habitat fragmentation and core habitat are discussed in Chapter 4, Section 4.2.3 of the EA.*

Comment 10-6

The Forest Service does not even discuss the fact that the Western Pennsylvania Conservancy recommended special protection for the Millstone Creek watershed because of its unusually high diversity of macroinvertebrates. It is likely that this diversity is, in part, due to the amount of unroaded areas within the watershed. The EA does not even explore this. This is important because macroinvertebrates are important indicators of water quality.

Response: *Please see response to comment 5-2. The effects to water resources are discussed in Chapter 4, Section 4.1.2 of the EA.*

Comment 10-7
The mitigation measures are not sufficient to protect this aquatic diversity. For example, the EA states that the project area is already "moderately developed" and "crisscrossed with various non-system roads." This is cause for concern because of sediment delivery to the West Branch Millstone and mainstem Millstone Creek where gilt darters and mountain brook lamprey, two state threatened species, have been documented. It is irresponsible to construct more roads in an area that is already "moderately developed" and "crisscrossed" with roads. It is even more irresponsible to carry out these activities within the increasingly rare unroaded areas. The EA did not adequately address these issues.

Response: *Please see response to comment 5-2. According to the Draft EIS for the 2006 Forest Plan, there is an average of 1.5 miles of OGM access roads per square mile on the ANF and about one percent of the forest is occupied by oil and gas wells (USDA-FS 2006d, p. xiii). In contrast, the density of OGM roads within the BCPA is approximately 1.2 miles per square mile and about 0.4 percent of the BCPA is currently occupied by oil and gas wells, both of which are less than the forest average. Therefore, our description of the BCPA as "moderately developed" and "crisscrossed" with various non-system roads is probably not an accurate description of the level of OGM activity within the BCPA. The effects to water resources are discussed in Chapter 4, Section 4.1.2 of the EA. The effectiveness of mitigation measures are discussed in Appendix B of the EA.*

Comment 10-8
The Forest Service used three criteria to develop the two action alternatives: 1) Impacts of road management changes for access and resource protection, 2) Impacts of proposed activities on unroaded areas, habitat connectivity, and fragmentation within the project area, and 3) Impacts to Yeaney Development. It is clear that these measures were inadequate in developing a broad range of alternatives as required by NEPA. The two action alternatives only differ in the amount of logging. Virtually all of the other activities planned under both action alternatives are identical. This indicates that logging is the overarching factor the Forest Service considered in developing this project.

Response: *Besides the alternatives considered in detail, seven other alternatives were considered but eliminated from detail study. Please see Chapter 2, Section 2.2 of the EA.*

Comment 10-9
The fact that an EIS is required for this project is obvious on its face. Typically, according to the NEPA FAQs, only projects whose environmental effects can be adequately described in a 10-15 page document can realistically considered to have no potential for a significant impact. Just as reasonable doubt prevents a jury from a conviction, the potential for significant effects prevents the Forest Service from exempting this project from the Environmental Impact Statement requirement. The fact that a 125 page Environmental Assessment and 90 page Biological Assessment were required to document this projects effects undermines the credibility of any attempt to exempt this project from the legally required EIS.

Response: *Please see response to comment 1-1*

Comment 10-10
This project will impact the occupied habitat of 5 forest sensitive species, several state threatened and endangered species, and one federally threatened species, previously designated old growth

forest areas, Unroaded forest areas of high value (logging and road building), the Millstone Creek watershed (some of the highest aquatic biodiversity of ANF mid-sized streams) and even proposed MIS species (Northern Goshawk) habitat. Even so, the environmental assessment is inadequate in how it ignores potential impacts to aquatic species that inhabitat the Clarion River such as the Green-face clubtail whose only population in the state is just downstream of the proposed project. There can be no rationale that would exempt this project from an EIS.

Response: *Please see response to comments 1-1, 5-1, and 5-2. The effects to RFSS and TES are discussed in Chapter 4, Section 4.2.3 of the EA.*

Comment 10-11
As mentioned above, conservation of forest roadless areas (whether labeled "Unroaded Areas" or "Inventoried Roadless Areas") is an important part of Allegheny National Forest management. The refusal to manage for roadless forest within the Allegheny National Forest contravenes the Multiple-Use and Sustained Yield Act. Several wildlife species, including the Northern Goshawk, have been documented to seek out the few unroaded forest areas that do exist within the Allegheny National Forest. For example, while less than 5% of the forest lies within roadless forest, 20% of core Northern Goshawk habitat falls within these roadless areas.

Response: *Please see response to comment 5-1. There are no known active northern Goshawk nests or territories within the BCPA. The effects to northern goshawk, a RFSS, are discussed in Chapter 4, Section 4.2.3 of the EA.*

Comment 10-12
The proposed logging and road building within the roadless areas within the Brush Creek Project Area are illegal because they contravene the roadless area protection rule. As the US Forest Service is aware, all inventoried roadless areas are protected from these types of commercial logging and road building activities. The illegal failure to follow their own policies on conducting roadless inventories in the most recent inventory resulted in much of the roadless forest within the project from being properly included in the roadless inventory for the Allegheny National Forest. One illegal action cannot be used to justify another illegal action. In this case, the illegal and inadequate roadless inventory can not be used to exempt areas that meet the policy requirements for inclusion in the roadless inventory from the protections that roadless areas receive.

Response: *This comment is beyond the scope of this document. Please also see response to comment 5-1.*

Comment 10-13
The Allegheny Defense Project's comments on the Brush Creek roadless areas and the process used for the roadless inventory are hereby incorporated by reference (and included with the electronic transmission of these comments).

Response: *This comment is beyond the scope of this document and has already been addressed at a higher level (in the new Forest Plan).*

Comment 10-14
The Forest Service is proposing in all action alternatives to use logging methods that their own data show to be unreliable. The US Forest Service has repeatedly published regeneration success data for shelterwood/herbicide combination treatments that show these methods to me highly unsuccessful (with at least a 1/3 failure rate within 5 years of cutting). Furthermore, recently

obtained data from the US Forest Service shows that success rates for salvage cutting have been as low as 43%.

The NFMA makes it clear that the Forest Service cannot conduct these types of activities where they cannot be guaranteed of "success".

Response: *Please note that the Forest Plan (p 4-16) states the following: "Make final harvests only from those sites where natural regeneration of desired trees within five years is highly probable." Research and experience are the basis for determining whether the harvest and regeneration practices planned can be expected to result in adequate restocking. Final harvests include clearcuts, overstory removal cuts, shelterwood removal cuts, and single tree and group selection cuts.*

As you can see, there is no requirement for adequate tree seedling stocking to occur within either five years following the herbicide treatment or five years following the shelterwood seed cut. The five year period actually begins when the shelterwood removal cut is completed. On the ANF in non-salvage situations, shelterwood removal cuts are prescribed to occur when adequate tree seedlings already exist on the site. However, adequate tree seedlings do not always exist at the time salvage final harvests are conducted following natural catastrophic events (wind, ice damage, fire, insects/disease, etc.), though appropriate measures are taken to reforest the areas unless site specific objectives call for conversion to a non-forest condition.

The ANF FY 2001 Monitoring and Evaluation Report (pages 31 to 34) provides an evaluation of tree seedling stocking in areas that had been treated with herbicides since 1987 (17,173 acres). Please note that the vast majority of these areas had very few tree seedlings present before they were treated. Local experience has shown that it takes time for adequate tree seedlings to develop following the herbicide treatment - as little as 3-5 years for Allegheny hardwoods, 8-15 years for some hardwood species, and perhaps as long as 20 years for oaks (ANF Draft Forest Plan, pp A-1, A-2, and A-8 to A-13). Often there must be a concurrent shelterwood seed cut to help ensure adequate lighting for tree seedling development. In summary, if we look at areas treated between 1987 and 1999 (where it has been two or more years since treatment), 73 percent (close to 12,000 acres) are making good progress toward developing adequate tree seedlings (i.e., are more than 50 percent stocked with tree seedlings). Given the length of time it takes tree seedlings to develop, the results are very encouraging.

We believe that the recent data mentioned by the respondent is an unpublished ANF summary in given to the respondent in response to information request regarding regeneration success on ANF (dated August 7, 2006). The recent data the respondent referred to does show 42 percent of the acres with adequate stocking (five years later) for blowdown salvage that occurred in 1996 and 43 percent with adequate stocking (five year later) for salvage cutting that occurred in 1997. Please note that these are based on total blowdown salvage harvest acreage for those years of 160 acres and 40 acres, respectively, and they are a response to natural catastrophic events. Also please note that for areas final harvested in ***non-salvage*** *situations in those same years (1144 and 1286 acres, respectively), 86 percent and 79 percent, respectively, were adequately stocked with tree seedlings five years after the final harvest. Looking at annual* ***non-salvage*** *final harvest between 1986 and 1998, the percent adequately stocked at the point five years after final harvest ranged from 75 percent to 95 percent, with an average of 85 percent. We believe this*

success rate is quite good given the number of drought years and defoliation events occurring during these years that could lead to substantial tree seedling mortality.

Finally, the ANF FY 2001Monitoring and Evaluation Report (pages 27 - 29) indicates that for all ***non-salvage*** *final harvest areas where the cutting occurred between 1976 and 1996, 96 percent are adequately stocked with tree seedlings and another 2 percent are more than 50 percent stocked.*

Comment 10-15
Furthermore, the NEPA requires that activities such as logging in roadless forest areas be analyzed for potential impacts. Therefore, while the Draft Brush Creek EA acknowledges clearcutting is bad for unroaded forest areas, it fails to actually look at how much logging would occur in roadless areas or what the impacts of those specific activities in those site-specific locations would be.

Response: *As discussed in the response to comments 5-1 and 5-2, there are no roadless areas in the BCPA. Effects to unroaded areas are discussed in section 4.1.3 of the EA.*

Comment 10-16
The Allegheny Defense Project is opposed to the Brush Creek project. The proposed project is a timber sale and nothing more. There is no other explanation for why there isn't a range of alternatives that looks at enhancing this area's primary features: recreation, wildlife, roadless forest, and aquatic biodiversity. There is no discussion of the implications of the proposed logging on the forest unroaded areas, or the fact that these areas meet Forest Plan policy guidelines for the Allegheny National Forest roadless inventory. There is no discernible means that 210 pages of documentation can say so little of substance about an area and the impacts to the environment and yet somehow it be suggested that this project does not require an environmental impact statement.

Response: *Comment noted. Please also see the response to comments 1-1, 5-1, and 10-8.*

Letter 11

Comment 11-1
Please do not compromise the integrity of the three unroaded areas within the Brush Creek Project….

The proposed action includes road construction in all three of the unroaded areas in the project area. URA #16, McRay Run, will be denigrated by over one half mile of new road. URA #25, Lick Run, will be reduced by over one mile of new road. URA #55, West Branch Millstone, will be diminished by less than one quarter mile of new road.

These actions are not in following with the intent of the AMS…

There are precious few unroaded areas remaining on the Allegheny National Forest. It is of the utmost importance that the inherent characteristics of these are protected.

Response: *Please see responses to comments 5-1 and 5-2.*

Letter 12

Comment 12-1
I am opposed to logging on national forests.

Response: *This comment is beyond the scope of this document*

Comment 12-2
You aren't considering the overall impact of your logging on the environment, including the effects on climate, carbon storage, water quality, and other benefits which aren't properly valued. Please stop this ill-advised proposal.

Response: *Please refer to Chapter 4 of the EA for the effects of implementing the proposed activities.*

Letter 13

Letter 13 did not contain any comments.

Letter 14

Letter 14 did not contain any comments.

Letter 15

Comment 15-1
Do not log in the roadless area of the Allegheny National Forest!

Response: *Please see responses to comments 5-1 and 5-2.*

Letter 16

Letter 16 did not contain any comments.

Letter 17

Comment 17-1
You should abandon your plan to clearcut and construct roads within the Millstone Creek watersheds, including its roadless forest areas as this would cause severe degradation.

Response: *Please see responses to comments 5-1 and 5-2.*

Letter 18

Comment 18-1
For God sake!!!! Can't you money hungry people leave a few beautiful places for people to go to…is everything about the almighty dollar!!!!!!!! God created the earth for us to enjoy…not make a profit with!!!!!

Response: *This comment is beyond the scope of this document. Also, please see responses to comments 5-1 and 5-2.*

Letter 19

Comment 19-1
Mother Nature has the way to take care of herself do not mess with her. Do not build roads to carry out her trees. Leave trees for all of us to enjoy. We are not the boss of Mother Nature, only her allies.

Response: *Please see responses to comments 5-1 and 5-2.*

Letter 20

Comment 20-1

We know that when polled, a majority of taxpaying public landowners say they do not want their forest logged or otherwise tempered with. Why are you using our money to destroy our land, when we don't want you to? Can't you just manage our forest like we ask?

Response: *This comment is beyond the scope of this document.*

Letter 21

Comment 21-1
Please, please do not build any more roads or cut timber in the Millstone Creek watershed.

Response: *Please see responses to comments 5-1 and 5-2.*

Letter 22

Comment 22-1
I am against any plan for logging and road constructions in the Allegheny National Forest,…The forest should be for the enjoyment of all citizens for its beauty and recreation and not destroyed for the profit of a few. I feel that any plans for plans for logging, clearcutting and road construction should be stopped.

Response: *This comment is beyond the scope of this document.*

Comment 22-1
…particularly the Millstone Creek area. Millstone Creek is a beautiful area of forest, which should be preserved. In addition, logging and road construction would jeopardize the water quality of the biologically diverse Millstone Creek watershed.

Response: *Please see responses to comments 5-1 and 5-2.*

Comments Received After the 30-Day Comment Period and Responses

Letter 23
This letter supports Alternative 3 – 2006 Proposed Action.

Letter 24
This letter opposes any logging or road construction in the Millstone Creek watershed.

Response: *Comment noted. Please see responses to comments 5-1 and 5-2.*

MAPS

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